

## **PROJECT ORIENTED LEARNING (POL) AS A COMMUNICATION TOOL OF ENVIRONMENTAL SCIENCES IN THE COMMUNITY OF SOHANGUVE – A CASE STUDY**

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### **ABSTRACT**

Projects are explained *inter alia* as “a piece of work that is organized carefully and designed to achieve a particular aim” (Oxford Advanced Learners Dictionary, 1995:926). The modern workplace demands proficiency in team efforts that involve communication, planning, management, and social skills. By engaging in projects that are meaningful in learning how to interact and communicate with others in worthwhile tasks, students learn skills and knowledge with higher transfer both to community and work settings (Kearsly and Schneiderman, 2001).

The foundation of Project Oriented Learning (POL) is communication between group members, tutors and the community. This paper will present the results of a case study where POL was used to communicate issues related to water and sanitation (environmental sciences) to the Soshanguve community.

*Keywords:* Project oriented learning; POL; environmental sciences; water; sanitation; interactive communication.

### **1. INTRODUCTION**

*“Kaizen” - continuing improvement and step by step growth through a willingness to take small risks”*

Communication of sciences have always been seen by many as a threatening and sometimes an impossibility, especially to individuals outside the scientific environment such as the general public or a diverse group with diverse interest or no interest to science at all. The questions asked and remarks made are *inter alia*: *How can one communicate complex technology to diverse groups? We talk a different language. How can science be made interesting? There are very few resources that can be used to illustrate and communicate sciences. No one understands anyway.*

Project oriented learning (POL) is a method where groups of students are actively engaged in trying to solve or address real-life professional problems and/or situations (Roma, 1998). The benefit of such an approach, is that they learn how to interact with one another and the community around them, they learn skills, gain knowledge,

develop attitudes and behaviours which will allow to cope better in a work scenario after completion of these studies (Kearsly and Schneiderman, 2001).

The approach followed by this case study was to use POL as a tool to communicate environmental sciences, and especially water and sanitation related matters, to school going learners. Students from Technikon Northern Gauteng (TNG) following a hands-on and interactive methodology communicating and transferring knowledge to local school going learners.

## **2. THE PROJECT ASSIGNMENT**

Students in the National Diploma Water Care at Technikon Northern Gauteng (TNG) registered for the subject Water Care Technology 3 (WCTC3) were given the following project assignment:

*“Develop a programme to communicate to school going learners the various methods of water supply and water treatment. Apply the programme to learners at any school/youth group and evaluate the effectiveness of your programme.*

*Choose in your groups consisting of six (6) students a group leader, a scribe, an information officer, two academic officers and a financial officer (according to the rules and guidelines in the supplied student reader).*

*Compile a short proposal on how you will approach your project. The proposal must include the following topics:*

- A Problem statement*
- A Aim(s)*
- A Objective(s)*
- A Target group*
- A Plan of action*
- A Available sources*
- A Budget needed to achieve the stated objective(s)*
- A Constraints/Limitations*
- A Letters of permission*

*The proposal must be handed in on or before the 1<sup>st</sup> of March 2002. The proposal shall be discussed with every group in the subsequent week and only then, you can proceed with your plan of action.*

*After completion of your project, you will submit a typewritten and properly bound report as per the prescribed format (see Meyer, 2000) on or before the 15<sup>th</sup> of May 2002. The report should include the following topics:*

- A Introduction*
- A Aims and objectives*
- A Methodology*
- A Results and discussion*

- A *Conclusions*
- A *References*
- A *Addenda (including letters of school and feedback from staff and students; evaluation)*

*At a student colloquium the group members will present their findings and experiences with invited guests and colleagues. The colloquium will be on Friday the 17<sup>th</sup> of May 2002.”*

## **2.1 The objectives of POL in context of the given project assignment**

The objective of this exercise was for the students involved to master the following skills:

- A Group work
- A Communication skills
- A Life skills
- A Writing skills
- A Problem solving and planning
- A Taking risks
- A Taking control of own learning experience
- A Professional behaviour
- A Project management skills
- A Interacting with people on different levels
- A Get the message across
- A Time management
- A Delegation of tasks
- A Accessing and acquiring information
- A Applying knowledge
- A Acquiring new knowledge
- A Disseminate knowledge

The second objective was to communicate issues related to water and sanitation to the learners. The third objective was to transfer knowledge, instill some problem solving and communication skills, and change the behaviour and attitude of the secondary school learners towards the environmental sciences.

## **2.2 The planning phase of the project assignment**

The proposal of the group of students was written, submitted on time and accepted with a few minor adjustments. The group was supplied with a small budget of R 150 to cover expenses. The group of Water Care students (aptly calling themselves The Dolphins) approached the school principal and the HOD Social Sciences of the Reitumetse High School in Soshanguve, Pretoria with a letter that explains the objectives of the project. In addition they also supplied them with a copy of their accepted proposal.

After they gained permission to present their programme to a group of learners, the group had to make all the arrangements of when and where they will meet with the identified grade 11 Physical Sciences learners. They had to negotiate for the time needed to communicate all they wanted to say regarding the specific subject matter at hand. Arrangements for transport and food for the group participants and learners were also part of their POL responsibilities.

Additionally, they had to know how many learners and educators will attend their presentation so that enough resources could be prepared and brought along. The resources included the Rand Water educational kits, posters, copies of brochures with relevant information, and field kits to do experiments on acid rain, soil pollution, pH, temperature, nutrients, and the microbiology of the water at school. The group had to prepare for the microbiological experiments in advance by pre-preparing a microbial analysis to serve as an example of the results.

After all the arrangements were in place, the group re-visited the school and perform the proposed interactive communication on water treatment, water analyses methods and sanitation to their target audience; i.e., disseminating and communicating their own required knowledge.

After completion of the planned activities, a report was compiled and submitted on the completed project assignment and presented to their peers. A video of this experience was made, which now serves as a further communication tool of the environmental sciences.

### **3. IMPLEMENTATION OF THE PROJECT ASSIGNMENT AT A SECONDARY SCHOOL**

The use of POL as a communication tool was achieved using the following three methods. Firstly, the students allowed for formal 15-minute presentations by the group members on water treatment, water quality, water pollution and sanitation. They then allowed the learners to interact, question, discuss and have mini debates over the water and sanitation issues. This was quite a lively affair as can be seen in Figure 1. The learners were involved actively and asked sensible questions relating to the presentations and information communicated by each student group member.

Secondly, the students performed uncomplicated and basic field experiments on the concept of acid rain and how it affects the water and the soil. They also used field kits to analyze for the pH, temperature, nutrients, heavy metals and microbial quality of tap water collected by the learners themselves (Figure 2). After the students illustrated the experiments, they invited interested learners to perform these experiments themselves, thus gaining hands-on experience (Figure 3). This opportunity was welcomed by many of the learners, especially since virtually all of them never had the opportunity to touch any scientific equipment through their secondary school career.



**Figure 1.** Learners and students debating an issue around water and sanitation.



**Figure 2.** Learners being showed how to take a water sample from a tap in the schoolyard.



**Figure 3. Learners actively involved in the on-hands experimentation.**



**Figure 4. Learners working through their pamphlets and information brochures.**

In the final method employed, the learners were supplied with copies of pamphlets on water treatment as compiled by the Rand Water Educational group. They were guided through the water treatment process, allowing for making additional notes and questions if they did not understand something. This exercise can be seen in Figure 4.

## **ASSESSMENT**

To be able to determine whether POL was such an effective method to be used as a communication tool of the water and sanitation issues, the acquisition, dissemination and transfer of knowledge by the students concerned were assessed. The students were evaluated on their final report, both on content and structure, using a specially designed rubric related to the original project assignment instructions. They were also assessed on the presentation of their experiences to their peers consisting of their fellow classmates and senior students in Environmental Chemistry. Another rubric on presentation/communication skills was used. According to the assessments, the whole group achieved all the set outcomes in context of knowledge acquisition, dissemination and transfer.

In addition, the proposed project assignment objectives were used as a guideline for assessing whether each group member developed the skills suggested. In context of using POL, it forced each member of the group to work in all aspects of his personal growth, thus most of the skill development set as an objective was one level or another achieved by them.

The secondary school learners involved were also evaluated using pre- and post-test questionnaires in order to establish whether some forms of knowledge were transferred through using POL as the communication tool. The results of this assessment will be addressed in detail in another paper. This paper will only mention the following major finding. There was a significant increase, from 15% to 86%, in the number of learners that could answer 10 questions related to basic issues with regard to water and sanitation correctly. The information needed to answer these questions, were dealt with during the communications and interactions between the group of students and learners.

## **CONCLUSION**

POL as a communication tool was effectively used to disseminate information and knowledge acquired and gained by the senior students on the suggested topic; i.e. water supply and sanitation. The assessment, acquisition, and application of knowledge were quite effective and came naturally to the group as the group grew in confidence.

All the stated objectives for skill development were achieved. Each student in the group had to fulfil certain roles as defined and described in the Faculty's student reader (Steyn, van der Linde and Van Bergen, 2002). Furthermore a wide variety of skills such as communication, writing and presentation was enhanced and developed to a higher level. Management and running of the projects, came to the fore as the deadlines for submission drew closer.

POL have this been experienced first hand through this case study as a tool for on-hands interactive communications of environmental sciences to school going learners form the community. With these facts in mind, this researcher and the Water Care students of TNG have adopted POL as a tool of communicating environmental sciences to the local rural communities.

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*This paper is dedicated to each student who was prepared to take those small risks that enabled him or her to grow.*