

# **Open & Distance Learning (ODL) Needs Consolidation through Innovative & Collaborative Learning Approaches: a Sri Lankan Case Study**

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## **INTRODUCTION**

The author has been involved since 1979 in teaching Chemistry at the B Sc degree level simultaneously to students in two non-conventional programmes outside the state managed Sri Lankan University system. He has also been involved over 42 years of his academic career in teaching Chemistry to B Sc students in many conventional Universities in Sri Lanka and in Papua New Guinea. Over the past four decades varied experiences have been obtained in both “teacher centred” and “student centred” teaching/learning approaches to a wide spectrum of students in many conventional and non-conventional tertiary level programmes. This paper discusses the results of case studies conducted over three years with a view to strengthen ODL by consolidation & coordination of such experiences into a more productive teaching/learning mode that attempts to make use of the better elements of ODL and face to face instruction within the particular needs & demands of students.

## **THE AUTHOR'S EXPERIENCE IN THE OPEN UNIVERSITY OF SRI LANKA (OUSL)**

Over two decades of Open & Distance Teaching at the OUSL has necessitated the author to write distance teaching material in the areas of Basic Thermodynamics (first year), Applications of Thermodynamics (second year), Advanced Thermodynamics (third year) and Surface Chemistry (second year): such material has been used by students from varying back-grounds, commitments and aspirations to obtain the (three year) B Sc degree through distance methodology at the OUSL; these students are not exposed to any face to face lectures apart from day schools, discussion classes, counseling sessions, assignments and practical classes. The attrition rate, particularly in the first year, has been particularly high for various reasons. However, a reasonable number have been successful in achieving their goals, upgrading their existing status and realizing their desired career re-development aspirations. Unfortunately, considerable numbers, even amongst those who have been successful, have been unable to make maximum use of the ODL method due to what can be referred to as “surface learning” which is learning that is devoid of deep understanding or conceptual learning; surface learning in this context arises from the inability of many students to afford the time necessary for in-depth study and learning due to their involvement in other programmes (mostly outside OUSL) and/or regular/part-time employment and/or other demands (such as family commitments); they are content, to undertake a mere cursory study geared not towards true learning through the expected/recommended ODL techniques but merely short term goals such as answering assignment tests and passing examinations. It is ironic that the ODL method that has proved itself globally to give enhanced access to true education at one's own pace, place and time in a meaningful way (particularly for those who have missed out conventional opportunities or otherwise occupied or disadvantaged) is underused with little pedagogical benefits accruing to some of them at the OUSL.

## **THE AUTHOR'S EXPERIENCE IN THE COLLEGE OF CHEMICAL SCIENCES (CCS)**

The author has also been involved in teaching Chemistry through the conventional method (lectures) over the past 30 years to students following a non-conventional programme outside the formal University sector: this refers to a four year Graduateship Programme in Chemistry of the CCS conducted by the Sri Lankan professional body of Chemists (Institute of Chemistry Ceylon) at the level of a B Sc (Honours) degree in Chemistry. This unique programme caters very well, inter alia, to qualified students who are unable to find admission into the very competitive (non-fee levying) state University system in Sri Lanka as well as those in middle level employment who wish to upgrade themselves and become professionally qualified Chemists. The author has been delivering lectures in thermodynamics and surface chemistry to these students and covering basically a course content that is very similar to that dealt with in the corresponding study material of the OUSL BSc programme referred to in the previous paragraph.

## **MAKING THE TEACHING SYSTEM MORE PRODUCTIVE FOR STUDENTS**

The author thus has the long experience of simultaneously teaching two sets of similar students in non-conventional environments but using two different study modes: the ODL method in the OUSL and the lecture method in the CCS. Both sets include many part-time students who have involvements such as other educational courses and/or employment etc. The general lack of time available and/or surmised to be available by both types unfortunately results in extensive rote and surface learning. Despite CCS students having more face to face contact with lecturers and greater access to library facilities, the general performance of a fair number amongst them was not very much different to similar OUSL students resulting in a considerable attrition rate amongst CCS students as well. It has to be mentioned, however, that the better/above average students in both systems, as may be anticipated, did very well under either system; however, the present case studies have been directed towards making the teaching system better and more productive particularly for average/below average students.

### **CHANGE OF TEACHING MODE AT THE CCS : Combined Lecture/ODL Mechanism**

The author therefore decided, on an experimental basis, to investigate firstly whether the more regularly available CCS students could be facilitated to improve their learning skills in a more constructive manner by using a hybrid/resonance mechanism involving both lectures as well as the ODL mode. The Thermodynamics course followed by CCS students in their first two years in two lots of 14 & 12 lecture hours in the first & second years respectively appeared to be ideally suited for this purpose since basically the same content was available in the printed course material used by the OUSL students in their first two years of study.

New students admitted into the first year of the CCS Graduateship Programme in 2005 were therefore issued the OUSL study material in advance of their lecture sessions but in small lots roughly corresponding to the author's usual progress in covering this material in face to face lectures. These students, to whom ODL was a completely unknown mode, were told to read the relevant modules and try to understand them, on a distance study basis, before they came for the lecture session; they were requested to come to the "lecture session" ready with difficulties and questions (that would have surfaced during their reading of the OUSL study material), to be clarified by the author. The students were told that the author will only deal with the basic as well as more difficult topics as formal lectures during the scheduled "lecture sessions," which he intended to use more for discussion and problem solving ; they were also told that they should feel confident to read , study and understand the OUSL study material at their own time, place and pace without much difficulty since OUSL students did so on their own without even having the benefit of a lecturer assisting them regularly. The students were then given the psychological backing to adopt this student centred approach and come ready with queries and problems which will be dealt with by the author, on the basis that the students had at least read the material before coming to the "lecture session".

Unfortunately, the author found that a majority of students had not acted according to the instructions given and were still expecting conventional lectures (A subsequent feed-back conducted revealed that while over 80% had attended more than 95% of the lecture sessions, only about 50% had read in advance even 50% of the OUSL study material given to them.). The author himself identified this situation from verbal information received from the students during the first few lecture sessions. This situation was not entirely unexpected since the availability of the customary number of hours for the lecture sessions scheduled on the time-table perhaps gave a feeling to these students that the conventional lecture may nevertheless be delivered in the usual manner while they could read the distributed OUSL material for greater understanding subsequently as supplementary reading material. Thermodynamics being generally regarded and having a notoriety as a difficult and somewhat unconventional/abstract macroscopic approach to the study of matter and also needing the use of some high school Mathematics perhaps aggravated the situation even further.

The author was therefore compelled, in the interest of the students, to face reality and alter his original strategy fairly early in the "lecture sessions": in addition to the topics which he intended to lecture on, he was compelled to continue to resort to the conventional lecture method to cover about 85% of the study material. The students were however deliberately not formally lectured to on about 15% of the OUSL study material content and were requested to read and understand that on their own using the distance study approach. Problem solving by the author in these areas attempted to answer most of the student queries without serious difficulty to students. A practice test conducted towards the end of the teaching session indicated mixed results which were however not disappointing. The results of student performances at the final examination was also not discouraging.

## **ANONYMOUS FEED-BACK FROM STUDENTS AT THE END OF THE COURSE**

A feed-back was conducted from the students at the completion of the thermodynamics course. The revelations were not too disappointing: many students did indicate that they had considerable problems with the study material since this was a completely new experience particularly in their first year. Having had all their high school education in the local languages, students also had the customary problem of switching over to English and understanding study material in a less-familiar study medium. Many were appreciative of the quality of the OUSL study material but were of the general opinion that other commitments prevented them from reading and understanding the OUSL study material before the relevant lecture session. However, the biggest surprise was that as many as 75% of the students answered the following question that appeared in the feed-back questionnaire in the affirmative:

“If students were asked to read all the OUSL study material , chapter by chapter, before they came for the lectures and the lecturer discussed difficult areas at length instead of giving formal lectures on every item in the course, will that be more useful to students?”.

Such an affirmative answer coming after the end of the course from such a large percentage of students, who had a different view during the early part of the course was revealing and encouraging since it indicated that the students who were now more experienced, mature and had more time to review their learning experiences and teaching outcomes felt that there was much more merit & advantage in discussing difficult areas at length rather than listening to lectures in all areas in the conventional manner. Furthermore, personal discussions with students also revealed that they could have used the OUSL study material much more profitably had they followed the author's original advice more seriously and realistically. However, it has to be also recognized that this new realization could also have arisen at the end of the course due to the fact that students are now more confident to study in the English medium than earlier and also are now much more knowledgeable about the non-traditional/difficult area of Thermodynamics. The feed-back also revealed that 40% of students, including the 25% who answered the above question in the negative, went on to submit the request, in a subsequent question, that they would rather opt for the availability of the OUSL material before the lecture as well as receiving the full complement of face to face lectures in the conventional manner; one would not be too far wrong in interpreting that this request is coming, by and large, from those who are intrinsically below average as well as those who want to take the easy way out by requesting the best of both worlds through a simultaneous dual mode approach! It has also to be recognized that having both modes in operation concurrently would be pedagogically unsuitable, unsatisfactory and undesirable since it will amount to spoon-feeding; such a method is also economically unsustainable since the OUSL material has to be individually distributed at some cost and if that cost is not to be met by reducing the lecturers' face to face instruction time, then the cost of offering the programme will also increase with consequential adverse effects. The more philosophical spin-off-benefit possible of ODL being used to give students a much desired student centred and independent approach to their learning in which the teacher plays largely the role of a facilitator than the conventional teaching instructor cannot also be overlooked and forgotten quite apart from the pedagogical and economic issues referred to above.

## **MODIFICATION OF TEACHING MODE IN THE CASE STUDY IN SUBSEQUENT PHASES OF STUDY**

Taking all relevant factors into consideration the author became convinced that the previous experiment was in fact not a failure but gave many constructive ideas and an indication leading pointedly to a different subsequent scenario: the author therefore recognized that it was perhaps too early in a student's life to have attempted this experiment in the first year. It was thought much more realistic and opportune to try it out in the second year for the same group of students when they pursued the 12 hour course on Applications of Thermodynamics in 2006/07. Such students were aware of the basics of Thermodynamics and are one year down the road with a limited ODL learning experience as well. The 75% affirmative response from these students referred to earlier was also a welcome sign.

The author therefore repeated the experiment indicated above but only on a 50: 50 basis: while all the OUSL distance study material was distributed in advance; half of it was, as announced, was not lectured to formally while formal lectures were conducted on the balance half comprising areas that were perceived from past experience to be more difficult by the author. The results from the second year students was very much more encouraging and the author was able to get many students to raise queries and seek clarifications during the “lecture sessions” from amongst the OUSL study material previously read by them. The relevant “lecture sessions” were confined to providing such assistance only. The examination results were also not very different from previous years; interestingly, students appear to have more self-confidence & are reaping benefits from the consequent student centred approach. The anonymous feed-back that was obtained at the end of the course was also much more encouraging and was generally much more appreciative of the “dual” approach as compared to their responses in the previous year.

The author is therefore confidently intending to repeat the experiment for the third consecutive phase in the current academic year. However, this time round it will be done in full measure as originally planned but given up in the first year and adopted only on a 50% basis in the second phase of study. It has thus been now firmly decided that, by and large, second year students following the "Applications in Thermodynamics Course" will be expected to depend entirely on the OUSL study material on the distance study mode and hardly any formal lectures will be conducted. The second year students will be adequately advised about this approach and system at an orientation session that will precede the formal commencement of the course. They will be cautioned that the face to face session will definitely be free of formal lectures and be confined to discussion, answering student queries and problem solving exercises. The OUSL material will be issued in small lots well in advance of the lecture session. They will then be expected to go through the material relevant to that which would have been covered in their lecture session, study and understand it as much as possible in a distance study context. They will consequently be expected to come up with queries based on difficulties encountered during their study of the OUSL material. The scheduled "lecture sessions" will thus for the most part be used to answer student queries and carry out problem solving exercises on the basis of problems and difficulties that will hopefully be surfaced by the students.

It is hoped, anticipated and firmly resolved that the author, during this third phase of the experiment, will by and large, not conduct a single formal lecture but will confine himself to clarification of difficulties and problem solving. The author is confident that he will be able to obtain maximum support and cooperation from a more mature and known group of students in their second year. He is also confident that he will be able to inculcate into the student minds the need to study the material before-hand in their own interest, particularly as an integral part of the student centred approach to learning that is a very desirable general outcome of the ODL mode of study. The second year Thermodynamics course, which is in fact more applied than the Basic Thermodynamics of the first year, will lend itself much more to the proposed experiment. Such consolidation of OUSL study material with face to face classes in the CCS in an innovative & collaborative manner is expected to bring a successful innovative and collaborative learning approach amongst the students. The experience gained thereby could hopefully be used to extend this modified dual approach to other courses in the CCS Graduateship Programme in the years to come. It may also be possible to have an overall smaller number of scheduled "lecture sessions" in the future since in the dual approach intended it may not be necessary to have as many hours scheduled as it used to be when formal lectures are conducted without the distribution of OUSL distance study material.