

RELEVANCE OF THE ADVANCED LEVEL MICROBIOLOGY CURRICULUM FOR EMPLOYMENT AND HIGHER EDUCATION IN SRI LANKA

T.L. Ishak¹ and C.L. Abayasekara^{2*}

¹ *Sri Pada Central College, Hatton*

² *Department of Botany, Faculty of Science, University of Peradeniya*

Introduction

Having passed the General Certificate of Advanced Level (A/L) Examination, some students gain entry to the University to continue with a tertiary education, while others try to obtain employment. In order to achieve either of the above successfully, with special reference to A/L qualified science students, they should gain a basic theoretical knowledge as well as skills during their period of study in the A/L classroom.

The A/L Biology syllabus introduced under the 1998 education reforms is composed of 9 units of which unit 7 is microbiology. This unit is expected to provide theoretical knowledge on the development of microbiology and its applications in day to day life as well as to provide practical skills (Ministry of Education, Sri Lanka, 2004).

The main objectives of the current study were to find out how appropriate the A/L microbiology lessons and practicals are, for the microbiology curriculum at the first year undergraduate level, and microbiology based employment. Further, an awareness of how successfully the teaching of the microbiology unit, including theory and practicals, is carried out in schools in the Kandy, Matale and Nuwara Eliya Districts of the Central

Province of Sri Lanka. In addition, to make recommendations to the Department of Education to fulfill the aims of the A/L biology syllabus put forward by them in 1998.

Material and Methods

As a preliminary step the A/L microbiology syllabus (theory and practicals), the objectives of the unit and the expected skills to be developed were critically inspected. Subsequently, the current study was carried out in three stages.

Firstly ten persons from different institutions/industries in the Central Province, where microbiological knowledge and principles are applied were visited. Informal interviews were carried out to find out the job opportunities related to microbiology in Sri Lanka, for the students who qualified from the A/L Biological Science stream. The suitability and capability of A/L qualified students that were recruited was discussed.

Secondly, a questionnaire was prepared to obtain information regarding the theoretical and practical knowledge of the first year students related to microbiology from the University Lecturers (n=13) who conduct microbiology lectures to first year students in the Faculties of Science of the Sri Lankan universities.

Finally, a questionnaire was prepared to obtain the information related to the teaching of the microbiology lessons in the schools of the Central Province. The questionnaire included questions to obtain general information related to the teacher, school and teaching methodologies used to teach microbiology lessons, availability of a biology laboratory, availability of other resources in the laboratory, student attendance during term time and other problems faced by the teachers when teaching microbiology lessons at schools. The questionnaire was distributed to 86, 1 AB schools in the Kandy (n=46), Matale (n=15) and Nuwara-Eliya (n=25) districts of the Central Province.

Results

Eighty percent of University lecturers and 80% of job providers were of the opinion that the theoretical knowledge of A/L qualified individuals was of an acceptable level, while 20% of both of the above categories was of the opinion that the theoretical knowledge was very poor. With respect to skills, the University lecturers were of the opinion that 10% of individuals were of an acceptable level, while 90% was of a very poor level. Job providers felt that 35% of individuals were of an acceptable level, while 65% were of a very poor level pertaining to skills.

Out of the 86 questioners distributed to schools, 54 responses were received (33, 08 and 13 responses from Kandy, Matale and Nuwara-Eliya districts respectively). It was revealed that the microbiology unit was usually taught at the end of the two year period, by which time the students did not attend school as

attending tuition classes was given priority. Student attendance in Grade 12 was 80, 78 and 90% in the Kandy, Matale and Nuwera Eliya districts respectively, while in grade 13 a decline in attendance was observed, viz; the attendance being, 10, 15 and 25% in each of the above districts respectively. Further it was stated that the time allocation for teaching of Microbiology was not sufficient and as a result the syllabus (both theory and practicals) was not adequately covered during this period. Fifty seven percent, 75% and 39% of schools did not complete the microbiology syllabus in Kandy, Matale and Nuwara Eliya districts respectively.

Reasons stated as to why the skill development was not to the required standard were, more than 20% of schools in Kandy and in Matale districts and over 60% of schools in Nuwara-Eliya district did not have a separate Biology laboratory. In addition, more than 50% of schools in all three districts did not have required facilities in laboratories. Lack of training and experience of teachers were other reasons highlighted by the teachers. Furthermore, the omission of microbiology practical related questions in the A/L paper, dissuaded most students from taking an active interest in microbiology related practicals, though they agreed that they are of interest and value. In addition, the abolition of a practical exam from the A/L examination adds to the limitation of time and effort made for practicals by students and teachers.

Discussion and Conclusions

The results obtained from the current study in relation to the Central Province of Sri Lanka, may be similar to the situation in the rest of the country. It is noted that a country could come up with a very good syllabus, but if it is not properly implemented the end result is unsatisfactory. Therefore, the Department of Education should take note of the above findings and emphasize the implementation of the curriculum reforms of 1998 and if needed make other suitable changes. This would pave the way to make maximum use of the intelligence and capability of the generations ahead by adequately sharing the rich reservoir of the knowledge and skills of our teachers as well as make maximum use of the expenditure incurred on educational development in our country. If the problems highlighted in the current study are not addressed we would have a future generation with a theoretical knowledge lacking practical skills, as mentioned in an earlier study (Peramune, 1999). Proper instruction in practical skills, not only helps in a complete awareness of the subject, but also promote attitudes and attributes needed in life and to fit into different life situations which are acquired often during practicals and working together in groups.

Recommendations

- Motivate students to attend school rather than go for tuition classes during school hours.
- Introduce strict rules to prevent students' absenteeism in schools.
- Activate the method evolved to monitor work conducted in

classrooms and laboratories frequently, to ascertain that practicals are actually conducted.

- Include questions based on 'microbiological skills', in the A/L paper.
- Re introduce practical examinations for students at a national level. Alternatively make arrangements to conduct practical examinations at a school level as a requirement to sit for the A/L theory examination, or conduct a practical examination for students with a Z score sufficient to enter the University, before university selections are made.
- Guide teachers to plan the microbiology lessons in parallel with laboratory classes which would provide opportunities for scientific inquiry by students.
- Train teachers to conduct practicals related to microbiology, with the use of limited resources and to set up an elementary microbiology laboratory with the minimum requirements, such as oven, pressure cooker (instead of autoclave), Bunsen burners, and microbiological media.
- Provide a separate Biology laboratory, equipped with necessary basic equipment to every 1 AB school.

References

- Ministry of Education (2004). The Development of Education, National Report, Sri Lanka. 6-7.
- Peramune, T.K. (1999). The impact of the simple biological projects in learning biology. M.Sc. Research Report, Postgraduate Institute of Science, University of Peradeniya, Sri Lanka. 66.