

SUBJECT REVIEW REPORT

DEPARTMENT OF
SCIENCE AND TECHNOLOGY EDUCATION



**FACULTY OF EDUCATION
UNIVERSITY OF COLOMBO**

8th to 10th February 2010

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CONTENTS

| | Page |
|--|-------------|
| 1. Subject Review Process | 1 |
| 2. Brief History of the University, Faculty and the Dept. of Science and Tech. Education | 2 |
| 3. Aims and Learning Outcomes | 6 |
| 3.1 Aims | 6 |
| 3.2 Learning Outcomes | 6 |
| 4. Findings of the Review Team | 7 |
| 4.1. Curriculum Design, Content and Review | 7 |
| 4.2. Teaching, Learning and Assessment Methods | 10 |
| 4.3. Quality of Students including Student Progress and Achievements | 12 |
| 4.4. Extent and Use of Student Feedback | 14 |
| 4.5. Postgraduate Studies | 15 |
| 4.6. Peer Observation | 16 |
| 4.7. Skills Development | 16 |
| 4.8. Academic Guidance and Counseling | 18 |
| 5. Conclusions | 19 |
| 6. Recommendations | 21 |
| 7. Annexure | 23 |

Quality of education within a specific subject or discipline as well as the programmes offered by an academic department. It is focussed on the quality of the student learning experience and student achievement. It is designed to evaluate the quality of undergraduates. This subject review report presents the findings of the subject review assessment of the academic standards achieved and the quality of learning opportunities provided in the Department of Science and Technology, of the Faculty of Education, University of Colombo.

The review team consists of Dr. (Ms) T.Srini V. De Zoysa (Open University of Sri Lanka), Dr. W.G.S. Kelum (University of Sri Jayewardenepura), and Dr. (Ms.) P.R.K.A. Vitharana (University of Peradeniya), and the team visited the Department of Science and Technology during the period from 8th to 10th February 2010.

The review was conducted adhering to the guidelines provided in the *Quality Assurance Handbook for Sri Lankan Universities*, published by the CVCD and University Grants Commission in July 2002. The review was based on the Self Evaluation Report (SER) submitted by the Department of Science and Technology and supported by the information provided and gathered during the three-day site visit to the Department of Science and Technology, University of Colombo.

The following aspects of education/provision were considered under the review assessment:

1. Curriculum Design, Content and Review,
2. Teaching, Learning and Assessment Methods,
3. Quality of Students including Student Progress and Achievements,
4. Extent and Use of Student Feedback,
5. Postgraduate Studies,
6. Peer Observation,
7. Skills Development,
8. Academic Guidance and Counselling.

The evaluation of eight aspects was based on:

- Meetings held with the Vice Chancellor, Head of the Department, Members of the academic staff, Technical and non-academic staff, undergraduate students of the Department of Science and Technology final year, Students of Masters of Education (aGeneral and Science Education), one student of Masters of Philosophy, and student counsellors.
- Observation of Department and facilities of the Faculty (Faculty computer centre, audio visual equipment, lecture rooms, etc.).
- Observing lectures and student presentations.
- Reviewing documents available at the Department.

Each of the eight aspects was judged as 'good', 'satisfactory' or 'unsatisfactory' paying attention to the strengths, good practices and weaknesses found in each area. An overall judgment was given as 'confidence' or 'limited confidence' or 'no confidence' after taking into consideration the judgments given to each of the eight aspects,

UNIVERSITY, FACULTY AND DEPARTMENT

University of Colombo. In Sri Lanka is closely linked to the history of the University of Colombo. In 1870 the Ceylon Medical College (from which the present Medical Faculty has developed) was established. In 1921, University College was established for higher education in Arts and Science. The University College, then affiliated to the University of London, was housed in the College House, which is used as the central administrative building of the University today. The University of Colombo became an autonomous institution in 1978. This is a legacy of higher education.

Over the last several decades, the University of Colombo has expanded substantially in terms of academic programs, student enrolment and facilities. It is one of the largest Universities in the country with seven faculties and several affiliated institutes and centres of learning.

Owing to its location in the metropolitan centre, the University of Colombo has the advantage of being at the hub of cultural, economic and socio-political activity in the country. It offers students opportunities for libraries, research centres, professional associations, theatres, art galleries, cinema halls etc. Students can make use of these facilities for their own academic and personal enrichment.

The Vision of the University

“To be a world class institution promoting human development through synergizing knowledge, education, research, and creativity, and entrepreneurship whilst upholding democratic values in a plural society.”

The Mission of the University

“To be the benchmark setting seat of higher learning and scholarship with an uncompromising commitment and dedication to providing society with human capital of high ethical standards, a proven sense of social responsibility, innovative, independent, and analytical in thinking and capable in becoming partners of socio-economic, cultural and environmental development.”

Faculty of Education

The Faculty of Education, University of Colombo performs a distinctive function in the training of graduates as professionals in Education and in the initiation of undergraduates to the field of Education. Its contribution specifically in the field of teacher education and in the field of higher education is of much significance to national educational advancement. Established in 1975, the Faculty completes 34 years of service to the University system as well as to the country.

The recommendations of the special committee on Education in 1943 (The Kannangara Report) stressed the need for teacher education in the country and the need to entrust graduate teachers education to the University. A Department of Education was set up in the University of Ceylon in 1949 and from its inception this Department conducted the Post Graduate Diploma in Education programme of studies which supported the professional training of graduate teachers in the country. This programme of studies was very parallel in composition and in conduct to the Post-Graduate Certificate of Education in the University of London and some other Higher Educational Institutions in the United Kingdom.

Under the University Act of 1972, with the re-organization of University education, a new Department of Education was established in the University of Colombo under the Faculty of Arts.

Faculty of Education programme, a four year programme of teachers for the secondary schools of Sri Lanka. In 1973 Faculty and was elevated to the Faculty status, thus commenced the Faculty of Education in the University of Colombo.

In 1975 when it was elevated to Faculty status, four Departments of study were set up within the Faculty. The Departments include,

- Department of Humanities Education
- Department of Educational Psychology
- Department of Social Science Education
- Department of Science and Technology Education

The Departments continue to function up to date, the lecturers in the Faculty belong to any one Department, on their choice and on their fields of specialization.

The specialization of teaching staff spreads across many diverse areas of studies in Education such as Education Psychology, Comparative Education, Philosophical and Social Foundations of Education, Measurement and Evaluation, Curriculum studies, Population Education, Maths Education, Science Education, Computer Education, Educational Management and Planning, Educational Administration, Early Childhood Education, Primary Education, Environmental Education and a number of other emerging areas. The staff of the Faculty possesses expertise and research experience in a number of fields to conduct the present programmes of studies.

At presents Faculty is offering many programs which include undergraduate and post graduate programs related to the education. Following are the degree programs offered by the Faculty.

Bachelor of Education (Special degree)

The Academic Component is offered by the Faculty of Arts while the Professional Component is offered by the Faculty of Education.

Post – Graduate Diploma Programmes of Studies.

The Faculty of Education conducts 5 Post Graduate Diploma programmes.

- Postgraduate Diploma in Education (General) Full Time & Part Time
- Postgraduate Diploma in the Teaching of English as a Second Language (TESL)
- Postgraduate Diploma in Education in Teaching of Drama & Theatre
- Postgraduate Diploma in Counseling
- Postgraduate Diploma in Community Development
- Postgraduate Diploma in Educational and Psychological Assessment

Master of Education Programme (Full Time and Part Time)

- Master of Education (General)
- Master of Education in Educational and Development Psychology
- Master of Education in Science Education
- Master of Education in Educational Management
- Master of Education in Teaching English to Speakers of other Languages (TESOL) (Full Time only)

M.Phil programme

The Faculty of Education conducts M Phil programmes for the students who have successfully completed M.Ed.

h.D programmes for the students who have successfully

The Mission of the Faculty

öThe mission of the faculty of education is to facilitate the development of committed professional educators with relevant knowledge, favourable attitudes and useful skills for teaching, research and service to the nationö.

The Department of Science and Technology

The Department of Science & Technical Education (DSTE) was established as the fourth Department of the Faculty of Education in 1975. The pioneers in this process were ; Professor Ranjith Ruberu, Mr. D.G. Wakula Gunapala, Mr. Justin Perera and Mr. Velayutham.

The naming of this Department as Science & Technical Education relates to the fact that there was a need to train the Science and Mathematics graduate teachers of the School system, the Lecturers of the training colleges and technical colleges. The subjects involved in their training for professional development were Curriculum and Instructional methodology with regard to physical Science or lively- hood skills. In addition to these subjects several electives have also been assigned to this Department Namely: Environmental Education, Educational Technology, Population Education and Computer Education. Further, Science Education at Masters Level has been another subject offered by this department. Supervision of Postgraduate research in the above curriculum arrears and Teaching Practice under the relevant school curricula has also been other tasks of this department.

Hence the Department of Science & Technical Education forms an important of the Faculty of Education by providing the above mentioned subject courses for the following Degree and Diploma courses.

| | | |
|-----------|--|-----------|
| | 1. Bachelor of Education (B.Ed.) | (4 year) |
| | 2. Postgraduate Diploma in Education (PGDE) | (1 year) |
| | 3. Master of Education (M.Ed.) | (1 year) |
| | 4. Master of philosophy in Education (M.Phil) | (2 year) |
| From 1975 | The relevant subject components of the above courses were conducted in the DSTE. | |
| From 1981 | The B.Ed. Course was terminated temporarily and hence there was no teaching in the DSTE for this Course. | |
| From 1991 | A new Postgraduate Diploma in Education (Week end course) was started in four Regional Centres, namely; Colombo, Ratnapura, Kurunegala & Galle. The DSTE contributed in the relevant subject components. | |
| From 1996 | The B.Ed. course was revived. The DSTE undertook its Co-ordination and the teaching of subjects relevant to it. | |

The vision of the department:

öAdherence, to the perspective of scientific humanism, in the global process of promoting Science, Technology and Mathematics education as a human right of the timeö.

The mission of the department:

öContribution to the overall effort of the Faculty of education to facilitate the development of committed professional educators with relevant knowledge, favourable attitudes and useful skills for teaching, research and service to the nationö

This Endeavour involves dealings with the Curriculum, training resource development and management, the part characteristics.

Also, as the courses that the DSTE offers are basically Science, Technology & Mathematics oriented a possible gap with regard to a balanced professional development programme in Education is adequately filled in by its contribution.

The key concept of the DSTE has always been 'Theory into Practice'. The challenge before us is to maintain and sharpen this perspective in the present and future contexts of the Education system of Sri Lanka.

The student composition of the Faculty of Education for last four years is shown in Table 1 and 2

Table 1: Student Composition of the Faculty of Education – Full Time

| Name of the Course | 2009 | 2008 | 2007 | 2006 |
|--|------|------|------|------|
| Bachelor of Education (B.Ed.) | | | | |
| Part I ó Sinhala Medium | 60 | 125 | 77 | 119 |
| Part I ó Tamil Medium | 23 | 39 | 25 | 16 |
| Part I ó English Medium | 21 | 23 | 14 | 16 |
| Total Part I B.Ed. Students | 104 | 187 | 116 | 151 |
| Part II ó Sinhala Medium | 125 | 77 | 113 | - |
| Part II ó Tamil Medium | 40 | 25 | 16 | - |
| Part II ó English Medium | 23 | 14 | 16 | - |
| Total Part II B.Ed. Students | 188 | 116 | 145 | |
| Part III ó Sinhala Medium | 79 | 120 | 65 | 66 |
| Part III ó Tamil Medium | 25 | 16 | 09 | |
| Part III - English Medium | 14 | 14 | | |
| Total Part III B.Ed. Students | 118 | 150 | 74 | 66 |
| Postgraduate Diploma in Education | | | | |
| Sinhala Medium Students | | | 116 | 116 |
| Tamil Medium Students | | | 40 | 40 |
| English Medium Students | | 22 | 40 | 38 |
| Master of Education | | | | |
| Master of Education General | | 14 | 15 | 30 |
| Master of Education Educational & Development Psychology | | 16 | 14 | 25 |
| Master of Education Educational Management | | 15 | 15 | 25 |
| Master of Science Education | | 08 | 09 | 19 |
| Master of Education (English Medium) | | | 08 | 19 |
| Master of Philosophy | | 18 | 14 | 27 |
| Ph.D | | | 01 | 01 |

Department of the Faculty of Education – Part Time

| Course | 2008 | 2007 | 2006 |
|--|------|------|------|
| Sinhala Medium | 1400 | 1053 | 546 |
| Postgraduate Diploma in Education – English Medium | 71 | 58 | 63 |
| Postgraduate Diploma in Counselling | 76 | 84 | 87 |
| Postgraduate Diploma in Community Development | 28 | 45 | 45 |
| Master of Education General | 60 | | 30 |
| Master of Education Educational & Development Psychology | | | 30 |
| Master of Education Educational Management | | | 29 |
| Master of Science Education | | | 30 |

3. AIMS AND LEARNING OUTCOMES

3.1 Aims

To promote capacity building of undergraduates and graduate teachers with respect to their professional competence at Degree, Diploma & Masters levels with special concern for Science, Technology and Mathematics Education.

The Department of Science & Technology Education contributes to the general courses conducted by the Faculty of Education. However, most course units offered by the Department are only electives. Therefore there is a need to design science and mathematics oriented courses too utilizing not only the available human and physical resources but also seeking further resources.

3.2 Learning Outcomes

On successful completion of the degree programmes offered by the Department students will be able to:

- Acquisition of transferable skills
- Be able to contribute to the up liftman of the system of education.
- Curiosity developed to explore ways of quality improvement of the classroom.
- Be able to guide students for favourable transformation.
- Undertake the responsibility & Accountability of producing productive citizens.

Objectives

- To provide a better learning environment for the future students.
- To improve the nature of the courses in scope and sophistication.
- To widen the academic services offered by the department.
- To provide more opportunities for staff development both academic and non academic.

According to the Self Evaluation Report(SER)the Science & Technology Department conducts both undergraduate degree programme and postgraduate degree programmes.

Bachelor of Education programme

The curriculum of the Bachelor of Education special degree programme consists of two components as academic and professional component. The academic component of the course is offered by the Faculty of Arts during first three years while the professional component is offered by the Faculty of Education during second, third and especially in the final year. The number of course units under each component and the credits assigned for them are given in table 1

Table 1: Course units and number of credits under each component

| Year | Academic component | | Professional component | | Total no of credits |
|-------------|---------------------|---------------|------------------------|---------------|---------------------|
| | No. of course units | No of credits | No. of course units | No of credits | |
| First year | 10 | 3 each | - | - | 30 |
| Second year | 9 | 3 each | 2 | 3 each | 33 |
| Third year | 8 | 3 each | 2 | 3 each | 30 |
| Fourth year | - | - | 11 | 3 each | 33 |
| Total | 27 | 81 | 15 | 45 | 126 |

As indicated in the above table students need to earn 126 credits in order to be eligible for the Bachelor of Education (Special) Degree.

As the professional component of the degree programme students are offered with Philosophical and Sociological Bases of Education (3 credits), Psychological bases of education (3 credits), Contemporary Problems and Issues in Education (3 credits) and Planning and Management at school level (3 credits) in the second and third years. In Addition Educational Assessment and Evaluation, Strategies of Teaching Learning, Curriculum Theory and Practice, School Counselling, Information and Communication Technology, Research Methodology, Electives, Minor Dissertation and Practicum are offered as the professional component in the fourth year of the B,Ed. Degree programme Out of the professional component of the degree programme Science and Technology Department offers course units only in the fourth year. Strategies of teaching learning, Curriculum theory and practice, Electives, Information and Communication Technology and Practicum course units are offered by the DSTE.

Strategies of teaching learning comprises of Part A and part B. Part A is general strategies and it is compulsory. Part B is special subject specific strategies and the students are required to select two out of the eighteen optional offered by the Faculty of Education. According to the SER and the members of the Department, DSTE offers course units Mathematics, Science and Technology, Physical Sciences, Biological Sciences as the special subject specific strategies. The elective course units offered by the Department are Population Education, Environment Education, Educational Technology and Computer Education.

Minor dissertation is another important course unit and it provides students with opportunities to identify a problem in the field of education, collect and analyze data and to develop competencies in the communication etc. Students need to complete 10 weeks teaching practice in affiliated schools for the course unit practicum. According to the explanation given by the senior members of the academic staff, students are guided to develop their

in plans, writing lesson notes and preparing teaching aids
l. Members of the review team had an opportunity to
ative teachers.

The lecturers further indicated that student teachers need to conduct peer evaluation and self evaluation in order to develop their competencies.

The views of the student teachers just started their teaching practice showed that it gives them an opportunity to apply theoretical knowledge they gain throughout the course of work. They further explained that the skills they developed through the workshops conducted at the DSTE are very helpful to them when working with the students.

The curriculum of the B. Ed Degree Programme is planned to achieve the objectives of the degree programme. The programme and the course units were in a suitable level to provide students with an understanding of the foundation of education and also to develop required competencies paying them the way to be a successful teacher in the future.

The major problem faced by the Faculty is that their intake is only from the Arts Faculty students. Reviewers are of the view that it is better to admit at least some students from Management and Science. Faculties whereby, they can train teachers for all important disciplines of the school curriculum.

Post Graduate Diploma in Education (PGDE)

Post Graduate Diploma in Education (full time) and Post Graduate Diploma in Education (part time) are two main post graduate degree programmes conducted by the Faculty of Education. These two degree programmes are professional development programmes conducted for graduate teachers. As stated in the By Laws, course unit system was introduced to the PGDE full time Sinhala and Tamil media from the academic year 2004/2005. PGDE full time course is a one year course and teachers are granted one year study leave by the Department of Education to enable them to participate in this course. The curriculum of these two post graduate degree programmes are quite similar and the students need to earn 36 credits including twelve subjects 3 credits each and one non-credit course to be eligible to obtain the diploma

Organizing professional development workshops is a characteristic feature of the course and those workshops provide opportunities to enhance the teacher competencies of writing educational objectives, planning lessons, preparing teaching learning aids, classroom management etc. Teaching practice is the practical component of the programme. According to the information given by the staff during the period of teaching practice each student is affiliated to a Colombo suburban school for ten weeks. A mentor is appointed from each school to supervise teaching practice. Student teachers plan and organize their lessons with the guidance of mentors. Dissertation is a compulsory course unit and it is expected from

students to identify a problem in the field of education and to do a study. Students are assigned to small groups and a lecturer is responsible for each group to guide students to complete their dissertations.

The curriculum of the PGDE is structured to achieve the objectives of the programme. It is planned to provide student teachers with opportunities to enhance their pedagogical knowledge required to become effective teachers.

According to the SER, the course units offered by the DSTE and respective credits allocated are given in Table 2.

ts and no. of credits offered by the DSTE

| Course Unit | No. of credits |
|---------------------------------|----------------|
| General methods | 3 |
| Special Teaching methods | |
| Science | 1.5 |
| Mathematics | 1.5 |
| Physical science | 1.5 |
| Biological science | 1.5 |
| Information technology | 1.5 |
| Special Areas | |
| Population education | 1.5 |
| Environmental education | 1.5 |
| Educational technology | 1.5 |
| Computer education | 1.5 |
| Curriculum Theory | 3 |

Master of Education Progrmme

Faculty of Education conducts re-structured Master of Education Degree programme from year 2005. Out of the several Masters Degree programmes, DSTE contributes to the Masters of Education General and Masters of Education in Science Education. Master of Education is a one year programme. The component of the Masters of Education and the credits allocated are indicated in table 3.

Table 3: Components of Masters of Education and credits

| Component | No. of credits |
|------------------------------------|----------------|
| 1, Core courses | |
| 1.1 Foundations of Education | 4 |
| 1.2. Research Methods in Education | 4 |
| 2. Elective courses | |
| Three elective courses | 9 |
| 3. Research Workshops | 4 |
| 4. Research Seminars | 3 |
| 4. Dissertation | 6 |

A student needs to earn 30 credits in order to obtain Masters Degree. DSTE offers course units Scientific Foundation (1 credit), Curriculum Theory and Development (3 credits) and Research Methods for Master of Education (general) programme. Other than that the Department offers three elective course units for Master of Education in Science Education programme such as Nature of Science and Science Education (3 credits), Curriculum Process and Development in Science (3 credits) and Instructional Design and Evaluation in Science (3 credits).

Reviewers were able to discuss with students who follow M Ed. Science Education and some of the M Ed (general) students. The discussions with these students revealed that one year time period is insufficient to complete the course and they need another six months to

As they expressed with the completion of workshops on how to get a clear understanding about a research studies, they were able to complete the master's research. The students further indicated that they face practical difficulties in following the course after reporting for duty in the school.

Reviewers noted that curriculum of the M .Ed. in Science Education programme is not structured to provide students with a clear understanding of the subject related practical knowledge in specialized areas in Chemistry, Biology and Physics. Therefore at least 10 hours should be added to provide subject specific knowledge especially to help students to organise practical.

M. Phil in Education Degree Programme

The Faculty of Education conducts M. Phil. in Education programme for the students who have successfully completed M. Ed in education programme. M. Phil is a full time programme and it is a two year research degree. As explained by the staff supervisors, for M. Phil students are appointed according to the area of specialization. Two senior lecturers of the Department presently guide M. Phil students. According to the discussion held with a clerk a separate file is maintained for each M. Phil student guided by this department. The review team had the opportunity to discuss with one M. Phil student. She holds very positive attitudes towards the way the guidance is being provided by the Department as a whole and also by the supervisor. As she expressed, each M. Phil student submits a monthly progress report at the end of the month and evidences of these reports are available in the department. Research presentations are conducted once in three months. She further explained that library facilities are available at the Faculty library and the National Education Research Centre (NEREC) library.

The review team is of the view that the aspect of Curriculum Design, Content and Review would be judged as 'SATISFACTORY'.

4.2. Teaching, Learning and Assessment Methods

The academic staff of the Department of Science and Technology Education consists of 2 Senior Lecturers, 1 Lecturer, 2 Probationary Lecturers, 1 Senior Assistant Technical Officer and 1 instructor.

The review team had the opportunity of observing a number of teaching sessions conducted by the lecturers in the PGDE programme. The course outlines were prepared and distributed among the undergraduates and postgraduate students at the beginning of the lecture series and hand-outs were made available to the students. The medium of instruction is Sinhala and lecturers are competent in delivering lectures in Sinhala language.

None of the lecturers demonstrated student centred teaching but the lecture halls and the equipment provided to deliver lectures confined the lecturer to the podium preventing the lecturer to maintain acceptable level of interaction with the recipients. The lecture halls are with poor ventilation and facilities. The white boards in the lecture rooms are too small and have become discoloured and some of the writings on the board are not visible. According to the information given by the academic staff they prepare power point presentations for some lectures. Review team had an opportunity to observe teaching learning aids prepared by student teachers compiling in a cupboard. But these teaching aids were not properly displayed in order to get the maximum benefit out of them.

at the Department it possess only one large lecture hall, laboratory. Out of these two small rooms, one was available in this resource room are multimedia, overhead projector, some materials for teaching and all kinds of boards like panel board, magnetic board so on. Establishing this kind of a resource room is very important but this room should be equipped with more materials and equipment needed for effective teaching in the school system. Teaching aids prepared by students can be displayed in this room. It would be more useful for teaching as well as motivating students for teaching.

According to the information obtained from the staff, 3 hour 8 workshops are planned for B. Ed. and PGDE students for skill development. According to the views of B. Ed. students these workshops are very helpful to them for lesson planning, writing objectives and other skills needed for teaching. Having discussed with the lab assistant about the equipment it was clear that this equipment have been requested two years ago. As explained by the Head of the Department 12 hours orientation programme is conducted before sending students to teaching practice. As he further explained student teachers do demonstration lessons and they get the experiences of planning and preparing learning materials and conducting lessons in these workshops. Likewise the lecturers comment at the end of lessons provided feedback to students

Teaching practice is organized properly. PGDE full time students are affiliated to schools during 10 weeks and part time students are subjected to 12 weeks supervision in their own schools. PGDE part time teaching practice is organized into two stages. The first stage is at their schools and second is in another school nominated by the Department. Both PGDE programmes continuous supervision is done by the mentors who are appointed from the school itself and trained by the university. According to the lecturer responsible for teaching Information Communication Technology, practical sessions are arranged for the development of ICT skills of B. Ed. and M. Ed. Students. One lecturer and instructor is responsible for conducting their lessons. DSTE possesses one computer lab with nearly 25 computers and the responsibility of faculty computer lab also assigned to a lecturer in this Department. M. Ed and M. Phil students are not accessed to the computers for their studies. It is essential to provide computer facilities for these postgraduate students at least limited number of hours.

Assessment Methods

According to the staff and the SER formative and summative evaluation is carried out in all programmes as in course evaluation and end of course evaluation. PGDE and B. Ed. Programmes weightage for in course evaluation is 30% and end of course evaluation is 70%. Reviewers were able to observe assignments and presentations as the methods of in course evaluation. According to SER constructions, practical work and group work also use as methods for in course evaluation. As it further explained in the SER two assessment methods are chosen for in course evaluation and weightage of 15% of the final mark is given for each to get 30% altogether. It was revealed from lecturers that teaching practice is evaluated by two lecturers and the average mark is taken as the final mark. Teaching practice evaluates according to a pre-determined set of criteria. Therefore each lecturer evaluates according to a same format. The weightage for in course evaluation and end of course evaluation in M. Ed. Programme is 50% each. Two assessment methods are chosen for in course evaluation and weightage for each evaluation is 25%. As lecturers further explained, if a student fail to earn 25 marks out of 50 for their in course evaluation they are not eligible to sit for the final exam. End of course evaluation is a written test of not less than two hours. Test consists of MCQ, structured essay and open essay questions. Two lecturers take the responsibility of constructing papers. The answer scripts are also evaluated by two examiners and if the

more than five two examiners discuss and decide the final mark. If more than two examiners fail to come to an agreement a third examiner is appointed. In these cases final mark are the average marks of examiners.

However reviewers could not find any documents stating moderators and setters or the first marks and second markers, therefore it is better to keep all these records. Review team was unable to get an idea of number of teaching hours allocated to each lecturer as the Department does not maintain files for timetables of each course. However it was clear to the team that workload of the each lecturer is high due to the lack of staff.

Considering the above facts, the aspect of Teaching, Learning and Assessment Methods is judged as ‘GOOD’.

4.3 Quality of Students including Student Progress and Achievements

The Bachelors Degree Programme

The Department does not offer a separate Bachelors Degree Programme. The Bachelors Degree Programme is offered in collaboration with all four departments in the faculty. The faculty is offering the Bachelor of Education (Special) Degree programme.

The students admitted to the Faculty of Education for the degree of bachelors of education (special) are selected from the Faculty of Arts after the completion of year one of the program. The undergraduates successfully complete the course unit of “Education for Individual and Social Development” offered by the Faculty of Education are eligible to apply to enter the Bachelor of Education (B.Ed.) Special Degree and students are selected according to the merit basis of their first year examinations. Normal intake to the Faculty is 60 Sinhala medium, 15 English medium, and 25 Tamil medium students per batch out of approximately 400 applicants. Above statistics indicate the high demand for B. Ed. Degree. The Degree of Bachelor of Education (Special) course consists of two components – Academic and Professional components. The academic component of the degree programme consists of 10 three credit course units in the first year, 9 three credit course units in the second year and 8 three credit course units in the third year are mainly offered by the Faculty of Arts. During this period students are expected to complete 81 credits of the degree programme.

The professional component of the degree programme consists of 2 three credit course units in the second year, 2 three credit course units in the third year and 11 three credit course units in the final year and all these course units are offered by the Faculty of Education. Student should earn 45 credits from professional component A student should complete minimum of 126 credits to obtain the B.Ed Degree.

The completion rates of the last four batches of students in the Faculty of Educations are shown in the Table 4 given below.

Table 4: Bachelor of Education Results for the 2006 to 2009

| Year of Completion | Enrolment | 1 st Class Passes | 2 nd Upper Passes | 2 nd Lower Passes | General Passes | Fail | Dropout |
|--------------------|------------|------------------------------|------------------------------|------------------------------|----------------|-----------|-----------|
| 2006 | 130 | 45 | 74 | 03 | 00 | 08 | 00 |
| 2007 | 66 | 10 | 52 | 02 | 00 | 02 | 00 |
| 2008 | 74 | 15 | 52 | 00 | 00 | 06 | 01 |
| 2009 | 150 | 04 | 55 | 63 | 17 | 05 | 06 |
| Total | 420 | 74 | 233 | 68 | 17 | 21 | 07 |

93% and 18% students have obtained 1st Class Passes, 16% students have obtained 2nd Class Passes, 16% students have obtained 2nd Class Passes. It is also noted that failure rate

of 5% and a dropout rate of 2% were recorded. Above evidence shows that the performance and achievement levels of undergraduate students are very high.

In order to promote student achievements, the Faculty of Education is awarding one gold medal and also one prize for the Bachelor Degree performance.

- Paulis & Milly Jayasuriya Price for Education
- Prof. S. Rupasinghe Gold Medal for Education

Academic staff believes that their students are successful in securing employment after the graduation, however there are no records to prove this factor. Normally students are able to find employment within one year. We strongly recommend developing and maintaining databases on the progress and the current status of past out graduates. It is suggested to establish an Alumni Association of the pass out graduates of the Department to monitor the progress and the current status.

Specially developed indicators to measure progress of students, such as class participation rates are not available at present. Student participation in lecture is recorded but they are hardly used to monitor and guide the students' progress.

Apart from the undergraduate course mentioned above the Department of Science and Technology is involved in several full time and part time post graduate level courses in other faculties of the university.

Postgraduate Diploma in Education

Postgraduate Diploma in Education, offered by the Faculty is of one year duration. It is being offered on full time or part time basis.

Two methods of selection criteria are used for the Postgraduate Diploma in Education course. For the full time course selection is done by the Ministry of Education. Graduate teachers who have completed five years of service as teachers and three years of service as graduates can apply for the course. Out of the large number of applicants selection is done from a competitive exam conducted by the Ministry of Education and 150 students are nominated to Faculty of Education. For the part time courses selections are done by the faculty. Any graduate who works in the education field can apply for the course. Selection of students for the course is based on a very competitive test. Normal intake is 1000 to 1500 students.

The results of the last three batches of full time students passed out from the Faculty of Education are shown in the table 5 given below.

Table 5: Postgraduate Diploma in Education Results for the last three years

| Year of Enrolment | No. of Student Enrolled | No. of Students Completed |
|--------------------------|--------------------------------|----------------------------------|
| 2004 / 2005 | 125 | 95 |
| 2005 /2006 | 116 | 94 |
| 2007 /2008 | 161 | 130 |
| Total | 402 | 319 |

According to the data provided in the Table 5 above, 79% of the postgraduate diploma students have successfully completed the diploma. In order to promote student achievements faculty is awarding a gold medal for the best performance.

to student groups are published time to time by the purposes. But there is no proper database available with graduate students for various purposes.

Master of Education (in Science Education) Degree Programme

For the Master of Education (in Science Education) course, selection is done by the Department. About 10 to 20 students are selected for the last year full time courses and 60 were selected for the part time course. Graduates having 5 -Bø level passes for Post Graduate Diploma in Education or Bachelor of Education in a recognized University are qualified to apply for the Master of Education Courses. Selection is done by a competitive selection test conducted by the Department.

The results of the last two batches of full time and part time students passed out from the Faculty of Education are shown in the Table 6 given bellow.

Table 6: Results of the Master of Education (in Science Education) Degree Programme

| Year | No. registered | No. Completed exam | No. completed thesis | No graduated |
|----------------|----------------|--------------------|----------------------|--------------|
| 2005 fulltime | 18 | 17 | 8 | 4 |
| 2005 part-time | 30 | 30 | 11 | 8 |
| 2006 Full-time | 11 | 11 | 2 | 2 |

According to the data provided in the table above, all most 100% course work completion is reported from both full time and part time students. But research thesis completion and submission rate is very low. Thesis completion rate is only 36%. It is also observed that due to the various difficulties and problems a number of graduates completing the Masters Degree programme was around 21%. This situation needs to be analysed by the Faculty and Department further to improve the pass out rate of the Masters Degree Holders of the programme.

When the above facts are considered the aspect of the Quality of Students, Student Progress and Achievements could be judged as ‘GOOD’.

4.4. Extent and use of Student Feedback

The lecturers of the department have paid their attention to get the studentsø feedback on the content, the mode of teaching, etc, but not through any quantitative approach or else not through student feedback questionnaires. Instead, all most all the lecturers at the Department currently practice the collection of studentsø feedback on the individual lecturers, lecture content, mode of teaching, use of more comprehensive teaching materials such as lecture notes/ hand outsí , etc. This informal student feedback was evident during the review visit.

In this process, they have collected this feedback at the beginning as well as at the end of the lecture series. According to the identification of the studentsø requisites, the lecturers have revisited their lecture notes, modes of presentationí , etc. Individually this follow- up actions has been taken but none of the feedback summaries being produced in written form.

At departmental level currently there are no regular meetings with student society members to discuss student matters. But such dealings are normally happening in the respective lecture hours. Currently there is no formal student ó staff meeting hours for any subject. On certain special matters the student union members participate in the Board Meetings of the Faculty, but no such participation is at the departmental level.

Student feedback forms are readily available at the staff development centre of the University of Colombo, which can be easily modified and use in a formal manner for the student

nt. It is also good to analyse the comments received for development purposes.

m through teaching and learning process the department

needs to conduct student /staff regular meetings and special meetings at the request of the Staff or the students.

Another initiative which can be taken into consideration is to form a staff student interactive committee. The objective of this committee is to meet the representative groups of students representing each of the batches, to discuss academic problems.

Each lecturer can be allocated with a reasonable number of hours to meet students and it has to be incorporated in the academic time table as well. In addition, Lecturers should be available to discuss students' problems.

When the above facts are considered the aspect of the extent and use of student feedback, qualitative and quantitative could be judged as 'SATISFACTORY'.

4.5. Postgraduate Studies

The Department offers two Research Degrees, Master of Philosophy (M.Phil.) and Master of Education in Science (M.Ed.) full time and part time.

The M.Ed. Degree is offered under 2 major categories, M.Ed. majoring in an area of specialization and M. Ed. Degree General. M. Ed. Special Course consists of four components, Theory Courses (Core and Elective), Research Workshops, Research Seminars and a Dissertation. Under core courses foundation of education and Research methods in Education are compulsory courses and all four Departments offer these courses in collaboration. The Department of STE offers 3 elective courses under one major area of specialization. In the course leading to a M.Ed.(General), students have to select any three electives from specialized areas selecting at least from two departments. The evaluation in each course unit comprise of in-course evaluations and end course evaluation in which each evaluation carries 50% of the total mark.

M.Phil. Course consists of a research component only. All these research students are assigned to supervisors who provide individual guidance. The students should submit monthly progress reports on their research progress and the staff conducts monitoring sessions.

Since 2005, up to 2006 fifty nine students have got registered for M. Ed. Degree and 12 students (20%) have completed successfully. Since 2002 fifteen students have got registered for the M.Phil. Degree and 10 (66%) have completed successfully.

At present the Department is represented by 5 Lecturers, two Senior Lecturers, one Lecturer and two Probationary Lecturers. The Senior Lecturers having M.Phil Degrees and two other Lectures having M,Sc Degrees. No professors are available in the department but having three carder provisions allocated for the one Professor and two Associated Professors.

Due to the current structure and various full time and part time courses made heavy workload to the department lecturers. This situation has made it difficult for them to do research and complete their PhD as well. It is evident that very few of the Department members have publications in journals and research conference proceedings.

Staff members of the department are involved in research conducted by NEREC. It is important to develop more progressive research culture within the department.

Supervised by two senior lecturers of the department. It is possible to publish some findings of those studies jointly with their colleagues who are involved in teaching.

When the above facts are considered the aspect of the Postgraduate Studies could be judged as 'GOOD'.

4.6 Peer Observation

Academic staff members understand the significance of the peer observation as a powerful tool for improving the quality of teaching and learning process. Lecturers are positive towards peer observation. Team teaching is a good practice implemented in the Department of STE. Two academics get involved in conducting workshops and integrate together in one teaching session teaching, discussing, facilitating and observing. Informal feedback is provided to each other through this process in enhancing the quality of teaching.

All final examination question papers are set by one examiner and moderated by a more qualified examiner. This is a formal peer observation process practiced by the Department. Dissertations, Projects and answer scripts of final examinations are evaluated by two marking examiners and this process is also considered as a good method of peer evaluation.

Student teachers are involved in peer observation during their teaching practice process. They should observe teaching of their peers and provide feedback. The small number of staff members meets very often informally and exchange their views and get advice from present and retired senior staff members of the Faculty.

Department easily can implement the formal peer observation process in their teaching by using the common feedback forms developed by the staff development centre of the University of Colombo.

It is also noted that regular department meetings are not held by the department. No minutes are maintained in relation to the department decisions.

When the above facts are considered the aspect of the Peer Observation could be judged as 'SATISFACTORY'.

4.7. Skills Development

The Department gives priority for skill development of Graduates Teachers (in-service) and under graduates who hope to enter the teaching profession. Three major skill development components are identified.

- Development of competencies needed for teachers
- Skill development of Information & Communication Technology
- Development of research skills

Development of competencies needed for teachers

Competencies of Graduate Teachers are developed through Post graduate Diploma in Education Programme (PGDE) and competencies of undergraduates who are hoping to enter the teaching profession are developed through Bachelor of Education Programme (B.Ed.) These skills are developed through teaching practice component which is supported by theoretical courses.

The teaching practice component consists of 3 stages.

Development Workshops each duration of 3 hours for skill development of PGDE and B.Ed. students. These workshops are designed to develop skills in writing objectives, preparation of lesson plans, classroom management, preparation of teaching aids, classroom management. Preparation of teaching aids, classroom evaluation, Educational guidance and counseling, teacher personality and usage of computers. All these workshops are compulsory and a formative evaluation process takes place.

Two **Orientation Workshops** each conducted for 6 hours (total 12 hours) prior to the teaching practice component. At these orientation Workshops methods such as micro teaching, stimulation and demonstration are used by lecturers and teachers. These methods develop skills of student teachers.

Observation of a selected school is assigned to B. Ed. Students. They select a school and observe the culture of the school, administrative tasks, co-curricular activities, student-teacher relationships and the teaching- learning process of the school. The students are expected to submit a report based on the above themes. This assignment helps non teachers to get an understanding of a school environment.

At the **teaching practicum stage** the students are involved in teaching and peer observation takes place and each student is assigned to two lecturers. At this stage lessons are observed and feedback is provided to develop teaching skills of students.

At the evaluation stage in-course evaluation of teaching practice is conducted and 30% weightage is given to formative evaluation and 70% is given to the summative evaluation.

Skill development in Information & Communication Technology

The Department supports students to develop their ICT skills. PGDE and B.Ed. students are provided with 45 hours of basic IT skill development classes. M.Ed. students are provided with 8 hours of skill development in data analysis. PGDE and B.Ed. students are evaluated through in-course and end course evaluations.

Development of research skills

Research skills are developed by offering Research Degrees in M. Phil. and M.Ed. Degrees in Science, Mathematics, Curriculum and Instructional methodologies. Forty five hours of research workshops and 60 hours of research seminars are conducted for research students and each student is assigned to a supervisor to provide individual guidance. Projects are assigned to PGDE and B.Ed. students which contribute to develop skills in conducting small scale research studies.

Physical facilities available for skill development

Two teaching laboratories are available with minimum facilities. Staff members have tried their best to equip these laboratories with teaching aids. Two computer laboratories are available with 57 computers. B.Ed. students are charged Rs. 400/= for additional usage of computer laboratories.

Human resources available for skill development

Two senior lecturers including Head of the Dept. and 2 Lecturers Probationary are involved in all these skill development courses.

The Department adopts a mechanism for continuous evaluation using assignments, group and individual presentations, group discussions, viva-voce and project reports. Students are provided with guidance to improve their writing skills.



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pay attention to the development of management skills

When the above facts are considered the aspect of the Skill Development could be judged as ‘GOOD’.

4.8 Academic Guidance and Counseling

There are two student counsellors appointed by the Faculty of Education. Counselling service is available to students for the basic matters related to them (those that can be solved within the faculty counsellor office). There is a link with the senior student counsellor’s office where students get more counselling by experts. Students who need more counselling will be guided to the senior student counsellor’s office via faculty student counsellor who continues the relationship with the students by counselling the experts in the senior student counsellor’s office.

There are University level series of workshops, organized by the senior student counsellor’s office from time to time for the training of faculty student counsellors. The DSTE contributes in its capacity to resolve such student related issues undertaken by the faculty as a whole. One lecturer attached to the Department is also working as a student counsellor.

It is clearly evident that due to the unavailability of first three years’ students belonging to the Faculty and the Department, no major problems are happening within the Faculty.

Academic guidance is provided primarily at the inaugural sessions, using, and a group guidance method. According to the personal tutor system all academic members are assigned to several numbers of students for more close contact which will help Faculty to effectively sort students problems. The Department of Science and Technology Education has a ‘Open Door Policy’, in which students are allowed to meet lecturers at any given time, provided that they are available.

When the above facts are considered the aspect of the Academic Guidance and Counselling could be judged as ‘GOOD’

Based on the observations made during the visit by the Review Team and as per the facts discussed above the judgments given to those eight aspects under review are as follows:

| Aspect Reviewed | Judgment Given |
|---|-----------------------|
| Curriculum Design, Content and Review | Satisfactory |
| Teaching, Learning and Assessment Methods | Good |
| Quality of Students including Student Progress and Achievements | Good |
| Extent and Use of Student Feedback | Satisfactory |
| Postgraduate Studies | Good |
| Peer Observation | Satisfactory |
| Skills Development | Good |
| Academic Guidance and Counselling | Good |

Strengths/Good Practices

- Offering B. Ed as four year degree programme
- Introducing professional component of B.Ed, programme with the beginning of the second year
- Providing B. Ed. and PGDE students with sufficient knowledge of foundations of education
- Planning workshops to develop competencies of B. Ed and PGDE students.
- Including wide range of subject specific strategies for B.Ed. and PGDE programmes collaborating with all four departments and allowing students to select two out of them
- Offering many electives for B. Ed. and PGDE programmes.

Weaknesses:

- Lack of opportunities for PGDE students to get the experiences of organizing extracurricular activities
- Lack of opportunities for M. Ed. in science education students to get an understanding on practical knowledge on their areas of teaching like physics, chemistry and biology.

2. Teaching, Learning and Assessment Methods

Strengths/Good Practices

- Distributing course outlines at the beginning of the courses
- Conducting workshops to develop professional skills
- Mentoring system to evaluate and guide student teachers
- Evaluating teaching practice by two lecturers and also according to a common format.
- Evaluating answer scripts by two examiners

Weaknesses:

- Less interaction with the students in teaching learning sessions.
- Lack of required material for resource room
- Lack of senior staff members to work with the juniors especially in the large teaching learning sessions like PGDE full time
- Computer facilities available for M ED. students and M. Phil students to their own studies is not sufficient

3. Quality of Students, including Student Progress and Achievement

Strengths /Good Practices

- Students selected to the department are with a higher GPA
- Students pass rate in first attempt is substantial.
- Job security of the graduates is higher compared to other degrees.

Weaknesses:

- Ability of using English language of the students is insufficient
- Lack of a data base about the passed out students in the department.
- Lack of alumni association available for the department

ack

- Having an informal feedback system through interaction with students

Weaknesses:

- Well designed formal system to obtain students' feedback is not available
- Formal Student Staff interactions are not available.

5. Postgraduate Studies

Strengths /Good Practices

- The Degree of Master of Education is offered effectively in a collaborative approach integrating the expertise of all 4 Departments.
- The range of elective courses provides the option for students to select courses according to their specialization area and to match the needs of the education system.
- Students are motivated to do the research as sufficient theoretical knowledge base is given by the course work and research skills are developed prior to the research component.
- Students are provided with continuous guidance by internal staff members.
- Submission of a monthly progress report and conducting monitoring sessions are good practices continuing in the Department.
- Sufficient library facilities are provided at the main library and in the National Education Research Centre (NEREC) to do references.
- Post graduate Research students are provided with needed computer skills to do the literature reviews and data analysis.

Weaknesses:

- Only two staff members with M.Phil. Qualifications are involved in research supervision tasks.
- Due to heavy work load in delivering PGDE (Full time and part time week end courses) staff members do not have sufficient time to get involved in their supervisory roles and provide quick feedback to students.
- M.Ed. students face difficulties when completing course work and the research within a one academic year.

6. Peer Observation

Strengths /Good Practices

- Team teaching is a good practice in the Department.
- Setting, moderating and double marking of final examination scripts and projects is also a good practice.
- There is a close rapport among the academic staff members in the department.

Weaknesses:

- Lack of senior level staff such as professors to guide junior staff.
- A formal method of peer observation is not implemented in the Department which is not practiced in many departments in the University system.
- Regular department meetings are not conducted and records are not properly maintained.

- Development of teaching skills is done in a very methodical and in a continuous manner by conducting a series of activity based components.
- The staff members are heavily involved in skill development courses.
- Student teachers hold very positive attitudes towards this teaching skill development component. They appreciate the series of training workshops and orientation workshops conducted.

Weaknesses

- The academic staff members are not sufficient to conduct all these skill development components.
- ICT course is not offered in the Tamil medium.
- Teaching laboratories are not sufficiently equipped in order to enhance Science and Mathematics Education.
- Charging fees from B. Ed. Students for extra usage of computer labs. Is a barrier for development of their ICT skills

8. Academic Guidance and Counseling

Strengths/Good Practices

- Understanding the requirement for having student counsellors
- Having a set of student counsellors with positive attitudes
- Special training programs for the student counsellors are organized

Weaknesses

- Less prominence given to student counselling and guidance

6. RECOMMENDATIONS

1. Currently available infrastructure facilities for teaching and learning have to be improved in order to improve quality of the programmes.
2. Student consultation hours have to be incorporated in to the staff time tables, which will present a better picture of the staff performance and student-staff relationships.
3. Develop a database of undergraduates to monitor progress and achievement of students during the four year period.
4. Compile a database of graduates so that the Department could monitor the achievement of graduates in the job market. This could be achieved by establishing an alumni association.
5. Lecturers are to be provided with more facilities such as space, computers, internet facility with journal access for teaching and research activities.
6. Establish a subject related student society within the Department to improve management skills of the students.

isions should be provided to the Department to handle

8. Additional time duration of 6 months should be given to students to complete their dissertations.
9. The two teaching laboratories should be equipped with necessary apparatus and equipment in order to enhance skills in teaching Science and Mathematics.
10. Charging for extra usage of computer laboratories should be terminated.
11. Formal peer observation process and student feedback system should be introduced to the Department.
12. A course unit should be included for M. Ed. In Science Education curriculum to enhance practical knowledge of students on their areas of teaching like physics, chemistry and biology.

TED

- Vice Chancellor of the University of Colombo
- Head of the Department of Science and Technology Education
- Academic staff of the Department
- Non academic staff of the Department
- Student counsellors
- Undergraduate Students
- Postgraduate Students

Annex 2. List of Lecture Sessions Observed

- PGDE Practical Session
- PGDE Lecture
- Postgraduate Student Presentation

Annex 3. LIST OF FACILITIES OBSERVED

- Department staff members' rooms
- Department Premises
- Faculty Lecture halls
- Faculty IT/Computer lab
- University Library

Annex 4. LIST OF DOCUMENTS OBSERVED

- Faculty hand book
- Student evaluation forms
- Student attendance list
- Lecturer's time tables
- Lecture Materials/ handouts
- Research publications of lecturers