

SUBJECT REVIEW REPORT

**DEPARTMENT OF ELECTRICAL &
COMPUTER ENGINEERING**



**FACULTY OF ENGINEERING TECHNOLOGY
THE OPEN UNIVERSITY OF SRI LANKA**

30th July to 01st August 2007

Review Team :

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1. SUBJECT REVIEW PROCESS

Subject review process of the UGC involves evaluating the quality of education within a specific subject or discipline, focusing on the student learning experience and on student achievement related to both undergraduate and taught postgraduate programs. It is understood that the final responsibility for quality and standards remains within the institution itself, since it alone has the powers to control and to change existing practices.

Subject review process at the Department of Electrical and Computer Engineering (DECE) of Open University of Sri Lanka (OUSL) was conducted following the guidelines provided in the Quality Assurance Handbook for Sri Lankan Universities, published by the CVCD and University Grants Commission in July 2002. The quality of education was reviewed at the Departmental level according to the aims and learning outcomes listed below as given in the Self Evaluation Report (SEF):

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 (both qualitative and quantitative),
5. Postgraduate studies,
6. Peer observation,
7. Skills development and
8. Academic guidance and counselling.

The review team visited the DECE for three days, namely 30th & 31st of July and 1st of August 2007. The agenda of the three-day visit is given in Annex 1. The information related to the above eight aspects were collected by having discussions with the Dean, Head of the Department, members of the academic and non-academic staff, a group of undergraduate students (see Annex 2 for persons met during the visit), by peer observation of the teaching process (see Annex 3), by observing the facilities at the DECE and the Faculty (see Annex 4) and by examining the documents provided by the DECE (see Annex 5).

Each of the eight aspects was judged as good/satisfactory/unsatisfactory, noting the strengths, good practices and weaknesses in each. Considering the judgment of the eight aspects, an overall evaluation is reported at the end of this report out of the three judgments confidence/limited confidence/no confidence in the academic program.

2. BRIEF HISTORY OF THE UNIVERSITY, FACULTY AND THE DEPARTMENT

The OUSL was started in 1980 by incorporating the Sri Lanka Institute of Distance Education (SLIDE) which was functioning under the Ministry of Education and the External Services Agency of the then University of Sri Lanka. There were two Boards of studies at the beginning, one for Management, Science and Technology (MST) and the other for Humanities and Social Science (HSS). Later some restructuring took place transferring Management subject area to the HSS and MST being re-interpreted as Mathematics, Science and Technology. The MST started two degree programmes, one in science and one in Engineering. Subsequently three faculties were established, one of them being Faculty of Engineering Technology. The Departments of study under the Faculty of Engineering

Technology at its establishment were Civil Engineering, Mechanical Engineering, Electrical and Computer Engineering, Mathematics and Philosophy of Engineering and Textile Technology (later renamed Textile and apparel Technology). The Department of Agriculture Engineering (later renamed Agricultural and Plantation Engineering) was constituted later.

The vision of the DECE is to facilitate learning so that an opportunity is provided to students to empower themselves in the broad subject area of electrical engineering.

The mission of the DECE is to enhance opportunities for life-long learning of adults through Open and Distance Learning and support excellence in research and scholarship.

Current annual intake of the Faculty is around 2000 students and they directly register for one of the 9 different fields of specialization available in the faculty. Students have the option of changing their field of specialization during their studies.

At present (July 2007), there are 20 academic cadre positions in DECE, 17 of which are filled. Three Professor Positions are vacant and the DECE has utilized funds allocated for these positions to recruit five temporary lecturers.

A library is available for the use of the students and books can be borrowed by the students at Level 3 and above.

3. AIMS AND LEARNING OUTCOMES

3.1 Aims

The Study programme at DECE permits different exit levels for the students, namely 1 Advanced certificate level, 2 Diploma level, 3 Degree level. As this review concentrates on the Degree programme the aims and learning outcomes of that are stated below as given in the SER:

The aim of the Degree programme is to provide a high quality, balanced undergraduate study programme in engineering, while meeting the requirements of major Engineering Institutions, both in Sri Lanka and overseas.

3.2 Learning outcomes

On successful completion of the programme following learning outcomes are expected to be achieved by the graduates:

- Be creative and capable of analytical and innovative thinking in Engineering
- Be able to address social, environmental and economical issues related to engineering
- Be able to access and utilise engineering knowledge for the benefit of society.

4. FINDINGS OF THE REVIEW TEAM

The Review Team findings are given in the following sub sections under the headings 4.1 through 4.8:

- Curriculum design, content and review
- Teaching, learning and assessment methods
- Quality of students including student progress and achievement
- Extent and use of student feedback
- Postgraduate studies
- Peer observation
- Skills development, and
- Academic guidance and counselling.

4.1 Curriculum design, content and review

The curriculum of the DECE of the OUSL had been developed twenty years ago considering the aspects of the distance learning programme. The design and development of the original curriculum took about two years with the consultation and assistance of all stakeholders, the academia, the professionals and industry all the way through seminars and workshops. The intended outcome of the curriculum is that the graduates are anticipated to be creative and capable of analytical and innovative thinking in engineering while able to address social, environmental and economical issues related to engineering in addition to the ability to access and utilize engineering knowledge for the benefit of society. Also the revised curriculum is more open in structure since it allows a student to decide his/her individual needs and aspirations by allowing him to obtain a cross-disciplinary engineering degree by means of selecting courses meaningfully allowed by regulation and prerequisite constraints. The regulation of choosing courses is ensuring that students would accomplish a right blend of knowledge, skills and training which are required for an engineering degree.

The content of the curriculum is categorised as Engineering, Mathematics, Management, English, Computer Literacy, Training and Projects where minimum and maximum credits in each category is defined. Also some new courses were introduced considering the scope in job market and the development of technology.

The Review Team would like to state its observations and recommendations as the following:

- DECE is providing balanced curricula for students to master their knowledge, skills and training. Further, the content of the curricula is matched with the conventional degree programme in engineering offered by other universities.
- The open-structure of the curriculum by allowing students to choose cross-disciplinary courses is a commendable feature within the framework of distance learning.
- It is impressive to observe that a few new courses were introduced from time to time to meet the job market requirements.
- Even though, a major curriculum revision was carried out in year 2001, there is no indication for the next major curriculum revision plan. Since certain areas of

Electrical and Computer Engineering are changing rapidly, it is necessary of defining the specific intervals of curriculum revision of particular courses.

- Even though, some feedback was obtained from the past students for curriculum revision and development, there is no formal alumina for providing feedback in curriculum development. Hence it is recommended to form a formal setup to get the regular feedback from alumina on curriculum development.
- Most of the students are in a point of view that the duration of the degree programme is too long. Therefore, if it is possible, shorten the duration may attract more prospective students while reducing the number of drop off students in the middle.
- There is no evidence that the curriculum design, development and revision has been carried out by considering the accreditation requirements for the degree programme. It is good to consider those requirements during the next major curriculum revisions.

Except few drawbacks, it is evident that the DECE is maintaining a vibrant approach in Curriculum Design Content and Review.

4.2 Teaching, learning and assessment methods

In the OUSL setup, a student entering after GCE (AL) examination requires a minimum of 5 years to complete the study program, while majority of those who complete take 1 or 2 years over the minimum period. In order to distribute the student work load evenly over the total study period an upper limit is set on the student credits that can be taken in any academic year. Teaching and learning is facilitated through a combination of lecture materials, day classes, laboratory work, tutorials, project work and industrial training.

The method of evaluation adopted by the Department comprises continuous assessment through laboratory work in selected modules, tutorials and assignments and the year end examination. Evidence was produced to the Team that the examination question papers in Level 6 modules had been moderated by senior academics/engineers drawn from the Faculties of Engineering in the University system and Industry. Question papers at lower levels are moderated by the Department staff. We consider this to be a healthy practice which contributes to the enhancement of credibility of the standard the Department is striving to maintain.

As a policy the DECE strives to release the examination results within a month after the date of the last examination paper. This is commendable as some lower Level papers are offered by large numbers of students.

The industrial training component is jointly supervised by the Department, the Faculty Training Engineer and the technical supervisor at the training place. The trainee maintains a detailed log book during the training period. At the end of the training period, the student submits a detailed report along with the certified daily log book to the training Engineer. The final evaluation is carried out at an interview conducted by a panel consisting of representatives from the Department the training Engineer and the technical supervisor from the training place.

The Undergraduate project makes a compulsory component in the curriculum. The Students have the option of selecting an individual project (ECY6595), or a group project

(ECY6498) subsequent to a preparation module (ECY6197). The evaluation for both options comprises continuous assessments, presentations, report, viva/written examination. An external examiner is invited for the final project presentation/evaluation. Good practices adopted in other established faculties in respect of undergraduate projects and industrial training are in place in this Department too. Both the staff and students emphasized the usefulness of student presentations in the course of project work. It was reported that this enhances their communication skills. This contributes significantly to the moulding of a well-rounded engineer.

The Team observed with satisfaction that the laboratory reports of the students were marked by experienced staff in form of an interview with the student. The main objective of this practice is to minimize copying, but it offers the student an additional learning experience. The staff commitment in conducting this sort of evaluation is highly commendable as the student numbers especially at lower levels are very large. Marked reports are returned to the students immediately after the evaluation and were not available for the Team to review.

A computer laboratory with adequate number of machines is available for use by the students. The OUSL has a Library with about 100,000 volumes and standard journals to serve the academic community. It provides books to students on loan for a period up to two weeks and for overnight reference. Other standard practices available in similar libraries for accessing wider resources are also practised.

The Team, is of the view that the teaching, learning and assessment methods currently in place are adequate to achieve the objectives that the Department had set for itself.

4.3 Quality of students, including student progress and achievement

Unlike the conventional universities, OUSL does not have the control over the quality of the student entering to the faculty due to its policy of open entry which is one of the reasons for high rate of drop offs during the degree programme. Although the annual intake for the Faculty of Engineering Technology is about 2000 students, merely 1% (26 students in year 2005) has obtained their bachelor degree every year. It is unfortunate to hear that the proposal from DECE through the Faculty to the Senate for a screening method of prospective students for entry was failed at the senate level.

Review team would like to state its observation and recommendations as the following:

- Although the drop off rate is high, those who obtained the bachelor degree from DECE are well employed in public and private sectors as same as the graduates from conventional universities.
- Extra skill of self learning ability is particularly observed from the graduates of DECE while their self confident and motivation are high compared to the graduates from conventional universities.
- DECE generally produces more graduates than other five departments. In year 2005, out of 26 graduates from the Faculty, DECE accounted for 16.
- Students from DECE could win few prizes in student project competitions by challenging the students of conventional universities that ensures the quality of their projects and the guidance of the supervisors.

- High rate of drop off is the matter which needs to be paid attention immediately. Screening methods could be used as entry criteria to identify the prospective students.
- Maintaining the employment records of the past graduates will contribute to the student guidance which ultimately improves progress rate and achievements.
- Recognition needs to be obtained to the DECE by means of MOU with international distant learning institutions and/or getting accreditations from local and international institutions with the purpose of promoting the quality and job opportunities of the students.

Since the DECE has no control over the student admission process, the high rate of drop off is inevitable. However, the DECE is paying its effort to improve the Quality of students, including the student progress and achievement.

4.4 Extent and use of student feedback

Evidence presented to the Team revealed the existence of three types of questionnaires administered to the students at the end of each semester with a view to obtaining feedback on the evaluation of:

- teacher performance
- practical sessions, and
- field visits.

Information received from students is processed and available with the Head of Department.

Although the practice of compiling such information is commendable, the Team was not convinced that the information had been put to effective use. This weakens the process of improving teaching quality.

It is reported that student representatives on the Faculty Board make regular representations regarding contemporary issues of importance to the student community.

The Team observes that a concerted effort must be made to make use of the feedback information that has been so carefully collected and processed. It should continue to make use of this information to make qualitative and quantitative improvements in teaching and learning.

4.5 Postgraduate studies

There is no evidence of taught postgraduate study programmes being undertaken by the Department in the past since its inception. However, an interfaculty Postgraduate Course on Instructional Material Design and Development is being planned, where DECE will also be involved. One factor that works against the commencement of a Departments own postgraduate programme is that none of the specific areas have sufficient staff strength to conduct a postgraduate course. The expertise of the DECE covers a wide spectrum of subject areas in Electrical, Electronics and Computer Engineering.

Two probationary lecturers are undergoing postgraduate training, a requirement in their career development. Both of them are attached to reputed Universities in Australia working for PhD in fuzzy systems-computer science and biomedical engineering.

Two research students are currently enrolled in DECE and are reading for the MPhil Degree.

The Team views the prevailing situation related to taught postgraduate courses is due to reasons beyond the control of DECE and the staff has the motivation for improvement provided the existing barriers are removed.

4.6 Peer observation

There are no formal arrangements to conduct peer observations in the classroom. However, informal peer interactions take place in the Department meetings and course team meetings that are held regularly, where issues pertaining to teaching and learning are discussed. The review Team strongly recommends that the formal class room peer, observation and evaluation mechanisms are introduced.

However, it was revealed to the team that the curriculum design is done by a team and it was recognized as a kind of peer observation. Direct peer observation at classroom level is not feasible due to the inherent nature of the type of education (i.e. self learning as opposed to classroom teaching, however a limited number of day classes are conducted). Due to this reason, it will be a good practice to introduce teamed course design for all the subjects.

It was evident from the interactions the review team had with the staff that peer review is done to a reasonable level within the existing framework. However, it is recommended to extend the peer review process also to the day classes.

4.7 Skills development

The efforts taken in skills development through practical work are commendable though the physical facilities available in the laboratories are inadequate and not up-to-date. The students are well guided in doing their assignments.

The language skills of the students need attention. Students should be given more exposure to learn and use English language. The students' counterparts in conventional universities get constant contact with the fellow students and the staff and are enjoying the advantage of practicing the language better. Therefore it is necessary to fill the vacuum by some means.

Lack of communication and skills and presentation skills was evident in the majority of the student presentations the review Team evidenced.

The Team views the achievements of the Department on this regard are commendable related to engineering skills but are marginal with reference to transferable skills.

4.8 Academic guidance and counselling

A Student Guide Book is provided to all students when they seek admission from Faculty of Engineering Technology. Handbook is available in all three languages and prospective students are expected to read the Handbook before their registration. In addition to that a half-day prior orientation is given to all prospective students before their registration. A counsellor is appointed for the Faculty of Engineering Technology to handle the non-academic student matter; in addition to that an academic staff member is assigned as academic counsellor from each department. Also students are encouraged to contact the academic staff members at any time regarding their problem with the courses. Academic counsellors are also available on the registration day to help the students of selecting courses and credits.

Review team would like to state its observation and recommendations as the following:

- Due to the large number of students, academic and non-academic counsellors find difficulties to spend enough time with students. Hence we recommend appointing each and every staff member as academic advisors and assigning each of them an equal number of students.
- It is amazing to notice that the students contact the respective teachers of the courses over the e-mail to get their problems cleared. It is noted as a good practice in the distance learning programme to improve the staff student relationship and the teaching learning experience.
- Most of the students complained that the staff-student contact time is not enough. Therefore, it is recommended to increase the number of day classes at least in first three levels.
- Due to the large number of students, non-academic counsellor does not have the time to motivate the students towards their goal. It is also noted that the students are reluctant to meet the counsellors for guidance. In fact, students are really depending on their senior students for guidance on academic and/or non-academic matters as practised in most of the conventional universities in Sri Lanka.
- It is noted that none of the counsellors has undergone proper counselling training.

The Review Team is of the opinion that distance learning structure and large number of students are the main problems related to ineffective counselling and guidance. By distributing students under each staff member for counselling and guidance may help the students to get them better guided towards their goals. Hence a reorganization of the counselling method is recommended.

5. CONCLUSIONS

Curriculum design, content and review: The practices of DECE in curriculum design and review are commendable. The need for making course material to be used in the distance education process has led to a set of well documented and regularly revised course notes. However, the concern of the students that completion of the course needs at least 5 years should be addressed in the next major revision.

Judgment: GOOD.

Teaching, learning and assessment methods: Amidst an acute shortage of experienced academic staff in the Department it was evident that teaching, learning and evaluation is carried out through a combination of course materials, day classes (lectures & tutorials), laboratory work, assignments and year end examination/project presentations. The team observed with satisfaction that some innovative methods are implemented in evaluation of laboratory work. Efforts taken in reviewing the laboratory classes and assignments annually for the lower levels is commendable.

Judgment: GOOD.

Quality of students, including student progress and achievements: The OUSL policy is to keep the doors open for all students with minimum qualifications. Partially due to this fact the completion rate is very low. However, the DECE performs comparatively better within the Faculty and almost all the graduates have found gainful employment.

Judgment: SATISFACTORY.

Extent and use of student feedback: Team notes with satisfaction the collection of feedback information compiled by the Department on evaluation of Teacher performance, Practical sessions & Field visits. However, the review team is not convinced that this information is made use of effectively to improve the qualitative and quantitative outlook in the teaching and learning.

Judgment: SATISFACTORY.

Postgraduate studies: The review team was presented evidence regarding planning to launch an interfaculty post graduate program in Design and Development of Instructional Materials. However, in the absence of adequate senior staff it is unlikely that the Department could show any meaningful progress in own postgraduate program in near future.

Judgment: SATISFACTORY.

Peer observation: The peer observation extensively takes place in curriculum design activities, preparation of course materials, moderation of question papers and regular departmental and course team meetings. The nature of distance learning does not permit peer observation at class room teaching.

Judgment: GOOD.

Skills Development: Engineering skills development is properly addressed in the teaching learning process of DECE. However, development of other transferable skills inclusive of language and communication skills are not given sufficient attention.

Judgment: SATISFACTORY.

Academic guidance and counselling: The mechanisms that are in place for academic guidance and counselling do not appear to be very effective. The Team is of the view that the high drop off rate is partly due to ineffective academic guidance and counselling.

Judgment: SATISFACTORY.

Based on the observations made during the visit, the eight aspects are judged as follows:

Aspect reviewed	Judgement
Curriculum design, content and review	Good
Teaching, learning and assessment methods	Good
Quality of students including student progress and achievements	Satisfactory
Extent and use of student feedback, qualitative and quantitative	Satisfactory
Postgraduate studies	Satisfactory
Peer observation	Good
Skills development	Satisfactory
Academic guidance and counselling	Satisfactory

The overall judgment is suspended

6. RECOMMENDATIONS

The review Team makes the following recommendations to improve the quality of teaching, learning and evaluation process, The recommendations are given under the categories of human resources, physical resources and procedures and processes.

Human resources

- Action should be taken to fill the three professor positions that are currently vacant. The UGC and the Ministry of Higher Education should introduce adequate enumeration packages and other incentives to attract and retain qualified academic staff in the fields in demand.
- Academic staff is to be provided with training related to academic guidance & counselling considering the fact that the staff in an Open University requires this skill even more than those in a conventional University.

Physical resources

- The physical facilities available in the laboratories are inadequate and not up-to-date.
- Continuous upgrading of the computer laboratory, IT equipment and software is required.
- The University library needs expansion and the complain by the lower level students that they are denied of lending library facilities should be paid attention.

Procedures and practices

- Common practices adopted in other international distant learning programmes could be considered to improve the quality of all eight aspects.
- Proper use of the information collected by student feedback to improve the teaching learning process is recommended.
- The practice of carrying forward the eligibility for five years should be revised.
- Action should be taken to reduce the drop off rates. Improvements in academic guidance and counselling practices can help in achieving this.

- The minimum time period required for completion of the degree should be reduced currently from 5 years to 4 years. This can have a positive impact on attracting good students who are prepared to work on full time basis.
- Forming a formal alumina and obtain its feedback in every aspect may help to improve the feature of curriculum design, job opportunities, student progress and recognition etc.

7. ANNEXES

Annex 1 - AGENDA OF THE 3 DAY VISIT

Day 1 – 30th July 2007

08.30 – 09.00	Private Meeting of Review Panel with QAA Council Representatives
09.00 – 09.30	Meeting with the Dean and Head of the Department
09.30 – 10.00	Discuss the Agenda for the Visit
10.00 – 10.30	Tea
10.30 – 11.30	Department Presentation on the Self Evaluation Report (observing documents)
11.30 – 12.30	Discussion
12.30 – 13.30	Lunch
13.30 – 14.30	Observing Departmental Facilities
14.30 – 15.30	Observing Other Facilities (Library, Computer Centre,)
15.30 – 16.30	Meeting with Academic Staff of the Department (observing documents)
16.30 – 17.30	Meeting with Undergraduate Students
17.30 – 18.30	Brief Meeting of Reviewers

Day 2 – 31st July 2007

09.00 – 10.00	Observing evaluation of ECX2330 (observing documents)
10.00 – 11.00	Discussion with ECX3233 course team (observing documents)
11.00 – 12.00	Discussion with Control Systems course team (observing documents)
12.00 – 12.30	Meeting with post graduate students (observing documents)
12.30 – 13.30	Lunch
13.30 – 14.30	Meeting with technical staff and non academic staff
14.30 – 15.30	Observing student presentation Software Engineering II
15.30 – 16.30	Meeting with past graduates who have completed the project successfully (observing documents)
16.30 – 17.30	Meeting of reviewers

Day 3 – 01st August 2007

09.00 – 10.00	Observing student final project presentations (observing documents)
10.00 – 10.30	Academic Counseling core Aspect meeting (observing documents)
10.30 – 11.00	Reviewers Private Discussion
11.00 – 12.00	Meeting with Head and Staff for Reporting
12.00 – 13.00	Lunch
13.00 – 17.00	Report Writing

Annex 2 – PERSONS MET DURING THE VISIT

Academic staff

Dr. Sisil Fonseka, Dean, Faculty of Engineering Technology
Mrs. NS De Silva, Head, Dept. of Electrical and Computer Engineering
Prof. H Sriyananda
Eng. CJSAH Perera
Eng. LA Samaliarachchi
Dr. LSK Udugama
Eng. SN Wickramasinghe
Dr. (Mrs) KGHUW Rathnayake
Dr. KAC Udayakumar
Mrs. H Pasqual
Dipl. Ing. KARD Gunaratne
Miss EC Herath
Mr. MH Naushath
Mr. RMS Anura Kumara
Mr. JC Geeganage
Mr. Gehan Anthonys

Non-Academic staff

Mr. Chuminda Binduhewa, Electronics Engineer
Mr. S Manivannan, Technical Officer
Mr. EPA Jayasinghe, Technical Officer
Mr. HMJPK Hitinayaka, Technical Officer
Mr. P Samarasekara, Technical Officer
Mr. ED Liyanarachchi, Technical Officer
Ms. THY Samanmalee, Data Entry Operator
Mr. WADJ Wijesinghe, Lab Attendant
Mr. SAU Gunasekara, Labourer

Postgraduate students

Mr. Gehan Anthonys
Ms. Elena Herath

Undergraduate students

Lanka Perera	Level 6 Electrical
LVC Gunathilaka	Level2 Civil
SN Wickramasinghe	Level 1 Civil
PB Wanigasekara	Level 6 Computer
W Mahesh Chinthaka	Level 3 Civil
HPG Karunarathna	Level 4 Electrical
AG Faheem	Level 2 Civil
ACM Sifan	Level 1 Civil
AR Nawfees	Level 1 Civil
Isuru Wickramasinghe	Level 3 Computer

E Buddhika Prasad	Level 3 Civil
NA Ranjith Priyanka	Level 3 Computer
K Manoj Asiri	Level 4 Computer
LB Prabath Kalpa	Level 3 Electronics
EKT Chathuranga	Level 2 Civil
KG Jansz	Level 2 Electronics
AK Ahmed Rishath	Level 3 Agriculture
AC Mohamed Riyas	Level 3 Civil
Srirkulan Kuhathasan	Level 2 Computer
Madhuranga Thilaka	Level 2 Agriculture
Deshan Madhusanka	Level 3 Electronics
AMM Ifham	Level 6 Electronics
Manoj Sithara	Level 3 Electronics
D Ushan Aruna Fernando	Level 5 Electronics

Annex 3 – TEACHING SESSIONS OBSERVED

31/07/2007 –

Laboratory classes on ECX2330 Principles of Electricity (Dr. Udayakumara and Instructors)

Student presentation on Software Engineering II

1/08/2007 –

Student final project presentations

Annex 4 – FACILITIES OBSERVED

Library, computer centre and dispatch unit, RES

Departmental facilities, office space, staff rooms and laboratories

Hostel & Health centre

Annex 5 – DOCUMENTS REVIEWED

Course material

Lab sheets, Laboratory reports

Assignments & assignment mark sheets

Minutes of course team meetings

Students guide book 2007

Moderator comments on question papers

Personal files of lecturers who are on study leave

Project reports