It added a meaning to my academic career...

Portfolio Submitted by

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Acknowledgment

This portfolio would have been another dream without support from following people,

I owe thanks to Dr. Ruvan Weerasinghe, Director of University of Colombo School of Computing, Dr. Nalin Ranasinghe, Head of the Department of Computation & Intelligent Systems and generally the University of Colombo School of Computing for encouraging and facilitating me to follow the CTHE. I also like to thank my mentor Dr. Lalith Premarathne who has always guided me through my confusions and made me feel confidence on what I have done in improving the skills of students.

I also owe thanks to Prof. Suki Ekaratne, Director of Staff Development Centre (SDC) and Course Tutor, Ms. Shrinika Weerakoon and all other SDC staff for their invaluable advice, guidance and facilitations. I deeply appreciate their vision of improving higher education effectiveness in Sri Lanka.

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I am grateful to the students at the University of Colombo who participated in several courses in which I experimented my new teaching and learning philosophies. Finally, my utmost appreciation goes to my mother and brother for being with me in absence of all.
Executive Summary

This is my portfolio which contains reflections about me, my preparation to academia and my professional developments, my teaching and learning experiences, and my extended services to the society and the nation. This is a product of my obligations to CTHE (Certificate in Teaching in Higher Education), whose aims are to support its participants in exploring and developing methods and techniques of teaching, learning and assessment, and provide its participants with opportunity to reflect on and develop their skills and abilities as a teacher in a university process and a format in the spirit of the SEDA Professional Development Framework. CTHE was conducted by the Staff Development Centre of the University of Colombo. I was so lucky to follow a formal training in teaching in higher education in my early entry to university teaching.

This portfolio is organized in eleven chapters. The first chapter contains a summary about myself or ‘bio-data’. Chapter two discusses my reflections about the past and my mental development regard to acquiring skills and cognitive capabilities. Chapter three discusses the affect of CTHE and other professional development frameworks to improve my academic and professional activities.

Contributing to the development of educational processes and systems is a great activity in the academic system. Chapter four discusses how I have been able to clear the path to introduce the area Robotics and Ubiquitous to the education system and Chapter five discusses how I have further rectified my effort by designing the course SCS 4013 with learning outcomes and using constructive alignment to align learning activities and assessment.

Chapter six is an attempt to understand different types of learning, such as, deep and surface learning, while extending my use of learning and teaching approaches. Chapter seven discusses how assessment can be used to direct students for learning while presenting different types of assessment.
The focus of Chapter eight is to discuss how I have reviewed my teaching role. It discusses different types of evaluation methods, such as, student feedback and peer feedback, and it also discusses how I have evaluated others.

Chapter nine discusses my efforts to make me effective in my work. It discusses my practices of time management, dealing with papers, etc. In addition, it discusses how I manage my tasks after identifying there priorities. Chapter ten discusses how I manage my administrative duties.

The focus of last chapter, Chapter eleven, is two fold. First it discusses my contributions to research. Second it discusses my contributions to social and national development.

Each chapter (after Chapter one) begins with a list of learning outcomes, what the reader will be able to gain after deliberately reading the chapter. At the end of a chapter there is a discussion to discuss my reflections, achievements of SEDA outcomes and commitments to SEDA values.

In addition to chapters, there are few more components in this portfolio: mapping document on SEDA outcomes and values and appendices.
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**Glossary**

- **SEDA** Staff and Educational Development Association, UK  
  Visit: [http://www.seda.ac.uk/](http://www.seda.ac.uk/)

- **SDC** Staff Development Centre, University of Colombo  
  Visit: [http://cmb.ac.lk/](http://cmb.ac.lk/)

- **CTHE** Certificate in Teaching in Higher Education

- **UCSC** University of Colombo School of Computing  
  Visit: [http://ucsc.cmb.ac.lk/](http://ucsc.cmb.ac.lk/)

- **SLAIHEE** Sri Lanka Association for Improving Higher Education Effectiveness  

- **SWOT** Strengths, Weaknesses, Opportunities, and Threats

- **LMS** Learning Management System

- **LED** Light Emitting Diode

- **LA** Learning Agreement

- **LO** Learning Outcome

- **O/L** Ordinary Level Examination

- **A/L** Advanced Level Examination

- **WASN** Wireless Ad-hoc Sensor Networks

- **NASA** National Aeronautics and Space Administration

- **CS 3015** a subject module, Networking Technologies

- **CS 3008** a subject module, Data Structures and Algorithms

- **SCS 4013** a subject module, Applied Robotics and Embedded Systems

- **ICT 2002** a subject module, Systems Analysis and Design Group Project, semester 1

- **ICT 2012** a subject module, Systems Analysis and Design Group Project, semester 2
Mapping Document on SEDA
Outcomes and Values

Learning Agreements (LAs) index:

LA 01 Course design, learning outcomes, section 5.2
LA 02 Course design, assessment, section 7.4
LA 03 Lecture planning, active learning, section 6.5
LA 04 Student feedback, questions, section 8.3
LA 05 Time management, progress and maintenance tasks, sections 9.3.2, 9.3.3, 9.3.7
LA 06 Peer feedback for lectures, section 8.3
LA 07 Active learning, guest lectures, section 6.5
LA 08 Teaching small groups, section 6.7
LA 09 Student feedback for lectures, questionnaire, section 8.3
LA 10 Student feedback for coordination, questionnaire, section 8.4
LA 11 Time management, adopt a timetable, section 9.3.7
LA 12 Focused letter writing, section 11.5
LA 13 Assessment, laboratory report marking, section 7.5
LA 14 Setting questions, section 7.9
LA 15 Assessment, second marker’s sheet, section 7.8

The following two tables summarize the major contributions of my learning agreements to SEDA outcomes and values:

<table>
<thead>
<tr>
<th>SEDA Specific Outcome</th>
<th>Learning Agreement(s): how?</th>
</tr>
</thead>
</table>
| use a variety of methods for evaluating your teaching role | LA 04: Student feedback by small questionnaires and letters  
LA 06: Peer feedback for teaching  
LA 09: Student feedback questionnaire for teaching  
LA 10: Student feedback questionnaire for coordination |
| **inform** your professional role with relevant strategy, policy and quality considerations | LA 01: Learning outcomes  
LA 02, LA 14: Aligned assessment  
LA 03: Active learning  
LA 04, LA 09, LA 10: Student feedback  
LA 05: Time management and dealing with progress and maintenance tasks  
LA 06: Peer feedback  
LA 07: Increase the diversity of the course by guest lecturers  
LA 08: Small group teaching  
LA 11: Time management using a time-table  
LA 12: Improve my professional writing skills  
LA 13: Formative feedback to students  
LA 14: Effective question making  
LA 15: Improve report marking |
|---|---|
| **extend** your use of learning, teaching and assessment approaches | LA 01: Levels of learning  
LA 02: Aligned assessment, assessment to direct students to learning  
LA 03: Active learning into teaching  
LA 04, LA 09: Personalize teaching based on student feedback  
LA 07: Guest lecturers of different specializations  
LA 08: Small group teaching  
LA 13: Provide formative feedback to students  
LA 14: Aligned assessment  
LA 15: Effective report marking |
| **contribute** to the process of module/program design, implementation and evaluation | LA 01: Design learning outcomes for the course  
LA 02, LA 14: Design assessment aligning it with LOs  
LA 15: Effective evaluation of reports |
| **provide** support to students on academic/pastoral issues | LA 02: Tune assessment accordingly (section 7.6)  
LA 04, LA 09, LA 10: Fine-tune the course for variety of learning styles, support students for their problems (section 8.3) |
<table>
<thead>
<tr>
<th>SEDA Value</th>
<th>Learning Agreement</th>
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<tbody>
<tr>
<td>An understanding of how people learn</td>
<td>LA 01: Levels of learning</td>
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<td>LA 03: Active learning, lecture breaks…</td>
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<td>LA 04: Understand learning styles</td>
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<td>LA 07: Change learning environment occasionally</td>
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<td>LA 08: Small group learning environment</td>
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<td>LA 13: Support students’ learning by giving them feedback</td>
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<td>LA 14: Enable students to express their maximum</td>
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<td>Scholarship, professionalism and ethical practice</td>
<td>LA 05, LA 11: Management to professionalism</td>
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<td>LA 06: Compromise my dignity for the sake of my long-term development</td>
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<td>LA 09, LA 10: Standardize feedback</td>
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<td>LA 12: Professional writing</td>
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<td>LA 13: Transparency by using a standard feedback form</td>
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<tr>
<td>Working in and developing learning communities</td>
<td>LA 07: Allow input from guest lecturers, industry relationship</td>
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<tr>
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<td>LA 08: A group of learning community</td>
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</tbody>
</table>
| Working effectively with diversity and promoting inclusively | LA 04: Identify weak students and support them  
LA 07: A group of lecturers  
LA 08: Change learning environment  
LA 12: Effective writing  
LA 15: Include all aspects to course evaluation |
|-------------------------------------------------------------|-------------------------------------------------------------|
| Continued reflection on professional practice               | LA 01: Learning outcomes (LOs) for each topic (Appendices B2 and B3), LOs for each chapter of portfolio  
LA 02: Extend assessment of ICT 2012 (section 7.8)  
LA 06: Use a variety of feedback  
LA 09, LA 10: Diversify feedback techniques  
LA 11: Improve my time management  
LA 12: Improve other aspects that can improve my professionalism  
LA 13: Extend the effectiveness of laboratory practicals  
LA 14: Extend my question setting abilities  
LA 15: Extend course evaluation |
| The development both of people and educational processes and systems | LA 01: Develop the system as a result of learning outcomes for courses  
LA 02: Develop the system as a result of aligned assessment of courses  
LA 04: Student feedback into the system  
LA 07: Industry input to educational system  
LA 08: Small group learning philosophy to educational system  
LA 13: Formative feedback system  
LA 14: Effective question papers  
LA 15: Making the course evaluation process more perfect |
The following two tables summarize the major contributions of chapters in this portfolio to SEDA outcomes and values:

<table>
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<tr>
<th>SEDA Outcome</th>
<th>Location (Section Number) in Portfolio</th>
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<td><strong>identify</strong> your own professional development goals, directions or priorities</td>
<td>Chapter 2: 2.1 2.4 Chapter 3: 3.1 3.3 Chapter 4: 4.2 4.5 Chapter 5: 5.1 5.3 Chapter 6: 6.1 6.2 Chapter 7: 7.1 7.5 7.9 Chapter 8: 8.1 8.3 8.7 Chapter 9: 9.1 9.3 9.5 Chapter 10: 10.1 10.6 Chapter 11: 11.1</td>
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<td><strong>plan</strong> for your initial and/or continuing professional development</td>
<td>Chapter 2: 2.1 2.4 Chapter 3: 3.1 3.3 Chapter 4: 4.3 4.5 Chapter 5: 5.1 5.3 Chapter 6: 6.5 6.8 Chapter 7: 7.4 7.6 Chapter 8: 8.3 8.4 8.7 Chapter 9: 9.2 9.3 9.5 Chapter 10: 10.2 10.3 10.4 10.5 Chapter 11: 11.1 11.2 11.8</td>
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<td>Chapter 2: 2.3 2.4 Chapter 3: 3.2 3.4 Chapter 4: 4.4 4.4 Chapter 5: 5.2 5.3 Chapter 6: 6.5 6.8 Chapter 7: 7.5 7.9 Chapter 8: 8.3 8.7 Chapter 9: 9.2 9.3 9.5 Chapter 10: 10.2 10.3 10.4 10.5 Chapter 11: 11.2 11.8</td>
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<td><strong>review</strong> your development and your practice, and the relations between them</td>
<td>Chapter 2: 2.1 2.4 Chapter 3: 3.2 3.4 Chapter 4: 4.3 4.7 Chapter 5: 5.5 Chapter 6: 6.10 6.7 Chapter 7: 7.5 7.10 Chapter 8: 8.3 8.4 8.7 Chapter 9: 9.5 Chapter 10: 10.6 Chapter 11: 11.1</td>
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<tr>
<td><strong>use</strong> a variety of methods for evaluating your teaching role</td>
<td>Chapter 2: 2.1 2.3 2.4 Chapter 3: 3.2 3.3 3.4 Chapter 4: 4.3 4.4 Chapter 5: 5.2 5.3 Chapter 6: 6.4 6.8 Chapter 7: 7.2 7.4 7.10 Chapter 8: 8.3 8.4 8.7 Chapter 9: * 9.5 * Chapter 10: 10.6 11.1</td>
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<td><strong>inform</strong> your professional role with relevant strategy, policy and quality considerations</td>
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<tr>
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<td><strong>provide</strong> support to students on academic/pastoral issues</td>
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* = focus of the chapter itself
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<td>Continued reflection on professional practice</td>
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* = focus of the chapter itself
Chapter 1. Details About Myself

1.1. My family and me

- My Name in Full: Herath Ekanayake Mudiyanselage Hiran Bandara Ekanayake
- My Preferred Name: Hiran Ekanayake
- My Date of Birth: September 26th, 1978
- My Father: H E M Ranjith Ekanayake (passed away in 1993)
- My Mother: S M D Vajira M Jayatillake
- My Brother: H E M Nilantha B Ekanayake
- My Nationality: Sinhala
- My Religion: Buddhist

1.2. My contact details

- Office Telephone: +94-11-2589123
- Office Address: Department of Computation and Intelligent Systems, University of Colombo School of Computing, 35, Reid Avenue, Colombo 07, Sri Lanka.
- Email(s): hbe@usc.cmb.ac.lk – hiran.ekanayake@gmail.com
- Website(s): http://usc.cmb.ac.lk/People/hbe/ - http://www.geocities.com/hekanayake/

1.3. My employment details

- Lecturer, Probationary (Feb., 2006 - todate), Department of Computation and Intelligent Systems, University of Colombo School of Computing
- Full-time M.Phil Student / Research Assistant (Oct., 2005 - Jan., 2006), University of Colombo School of Computing
- Temporary Assistant Lecturer (Oct., 2004 - Oct., 2005), Department of Computation and Intelligent Systems, University of Colombo School of Computing
• **Temporary Instructor** (Sep., 2003 - Oct., 2004), University of Colombo School of Computing
• **Research Assistant** [Part-time] (Sep., 2003 - Feb., 2004), Sri Lanka Postal Department
• **Software Engineer** (July, 2003 - Aug., 2003), E-WIS Software (Pvt) Ltd.
• **Trainee Software Engineer** (April, 2002 - June, 2002), KPMG Ford, Rhodes, Thornton & Co.

1.4. **My academic record**

• Reading for a M.Phil by Research (2005 - todate)
• B.Sc in Computer Science (2nd Class Upper, Honours) 2003 - University of Colombo, Sri Lanka (see Appendix B)

1.5. **My research interests**

• Affective Computing
• Cognitive Modeling
• Cognitive/AI Robotics
• Embedded and Ubiquitous Systems
• Multimedia Database Systems
• Computer Security and Privacy

1.6. **Research publications**


1.7. Training received

Successfully completed the training on Research Techniques, Scientific and Report Writing, Research Project Proposal Preparation and Grant Applications and Procedures for Registration and Progressing with Ph.D. degrees, organized by Research Promotion Centre, in association with National Centre for Advanced Studies (Mar., 2006) (see Appendix B)
Participated for a workshop on Wireless Ad-hoc and Sensor Network training, conducted by Ericsson (Feb., 2006)

Participated for the TECS Week 2006, held at Pune, India, and received a 5-days training on Embedded Systems Modeling and Verification techniques (Jan. 3-7, 2006) (see Appendix B)

Participated for a 2-days training on mobile device programming, conducted by Axalto (2005)

Participated for a full-day training on Robotics Systems (IITC 2004)

Successfully completed a training on Career & Personality Development, held by the Faculty of Science, University of Colombo (2002-2003) (see Appendix B)

1.8. Other work experiences

- Conducting Lectures and Tutorials, Coordinating Course Modules and Collaborations
- Participated as resource person for workshops (IITC 2003)
- Team Member (2002-2003) of ebXML Security Team (OASIS-UCSC), University of Colombo School of Computing
- Committee Member, Sub-Editor, Editor (1998-2002) of Mathematical & Astronomical Society, University of Colombo

1.9. Extracurricular Activities

- Play keyboard and composing music
- Gardening
- Watching television: educational programs (Discovery channel, National Geographic Channel…), movies (science fiction…)
- Thinking about everything
Chapter 2. My Reflections About the Past and Mental Development

After deliberately reading this chapter the reader will be able to (but not limiting to),

- Describe the characteristics and personality of the author
- Describe how the past has been affected the author in his long run
- Describe how the author has developed on his career path
- Identify the skills of the author
- Recognize the values of the author
- Recognize author’s philosophy about the world

2.1. Introductory Remarks

I am very sure that most people who are in contact with me see me as someone who is different from an ordinary person. The reason why I am saying this is, most of the time I have realized that my interpretation of a particular incident or an aspect is different from if someone else does it. According to my belief, most others are narrow minders or they are trapped in their frames, i.e. they either tries to interpret things while limiting to what they believe the world is (an aspect of ontology). This is very apparent when we deal with the closed world assumption and frame problem of a robot. When describing the consciousness, Thagard (2005) quotes a suggestion of Drew McDermott (2001), who is an artificial intelligence researcher, that robots will eventually have consciousness in the same way that people do, namely they will have the illusion that they are conscious. Next, he extends this suggestion by adding his own thought that people’s experience of sight, sound, touch, pain and emotion are also ‘illusions’. This can be further rectified from Buddhist teaching which expands the distance between objects in the world up to our awareness through dividing it into five steps, those are,

- ‘Rupa’ or Signs (signals from the environment)
- ‘Waedanaa’ or Sensual (resulting neural excitation when visual, auditory and haptic sensory systems constantly stimulated by a stream of events from the environment)
‘Sangna’ or Perception (transformation of continuous sensory stream into discrete percepts of visual, audio and haptics)

‘Sankaara’ or Concepts (after associated with semantics)

‘Wingnaana’ or Consciousness (awareness)

Most people think that their consciousness is beyond fade and will last even after death. But, according to Buddhist teaching, all these five quantities are transient or impermanent (not eternal). Our consciousness is functioning and it bases on the concepts what gets available after perception. This is apparent from the two worlds we see when we are in awake and in sleep. The modern cognitive science has evolved to deal with these realities and the well known cognitive modeling architecture, the ACT-R (Anderson and Lebiere, 1998) is fully equipped with similar components. Therefore, we have to be more careful when we deal with the world, because there is a distance between our cognition and what is actually happening in the world. Even I can not get free from this reality.

However, in my case, I always try to interpret things into large number of layers. Some of those may get bias towards my discipline or towards my religion. Therefore, it is not a single answer I would give that someone would like to hear. But, I try to be kind enough to start my interpretation bending towards what my recipient would happy to hear. Furthermore, I always wish that my recipient is intelligent enough to grab all the views that I have developed in my answer. So far I have found no such individuals. Further I do not think I can be one’s such recipient. It may be a weakness of human beings.

On other hand, I am very weak in expressing my ideas or thoughts. I sense that my physical existence through my body is far behind my cognition or mind. Recently, my attempts have concentrated towards understanding this reality of finding out “who really am I”. I had a vision since my small ages. I wanted to become a scientist who can see beyond science and explain very existence. But yet I have failed to reach to that extent because my existence respect to time has determined to bind me to several other responsibilities. Meantime, I have to be in a process of defining my eligibility to the general stream of public. I am not a genius person like Albert Einstein who has been able to avoid the obstacles that had tried to block his pathway. But, I am very sure that if I could be able to reach to my full mind-fullness and if I can recover the full control of my body, I will be able to evoke my path to the enlightenment while reaching my goals and making revolutions in the future’s history.
The following topics would elaborate my story and justify the readiness of me to take such a challenge. But as I have mentioned in the above text, I write for those who can proactively grab my philosophy, because still I am very weak in expressing my full creativity as a simple written text. Never my writings or my actual physical existence would make me perfect.

2.2. My Past

My family consisted of four members: my father, my mother, I and my younger brother. My father is from Kandy and he was attached to Sri Lanka Police. My mother is from Colombo. I had born in Colombo on 26th of September, 1978. My mental awareness with memory developed on me when I was around 2-3 years of age. As a result, I have my deepest memories with Kahawatte village, where I spend most of my sand-ages (playing with sand). Even then I was doing small experiments with creatures and whatever I see. In one case, I had a habit of observing moving objects on the ground and I was used to press those objects to see that they get still. Reaction to this, I was getting punishments from my parents. But I did not know why they punished me until at a later age I got to know that it is a sinning of one of my religious moral laws (With the time I reflected most of the foundational laws into my moral settings to become a good human).

I entered to my first Montessori at the same village. I can remember my first day to the Montessori. I was so excited. My father and my mother took me with them promising that they will stay with me until it is over. Next, they referred me to someone over there (principal). Suddenly my parents disappeared. I was so frightened and started to cry loudly. I can not remember what happened next. I got several strikes by the person over there. But thereafter, I never afraid to stay in the Montessori without my parents. With the time I enjoyed my Montessori life. I had participated to several student dramas as well. Meanwhile, the second member of our family, my brother, born on 23rd of June, 1983.

I could not finish my Montessori education completely while sitting at Kahawatte. My father was transferred to Colombo and we came back to our home village. My parents entered me to another Montessori, which has been attached to a church, not much far away from my home. After my Montessori education, they put me to a school and it was CWW Kannangara Madya
Maha Vidyalaya in Colombo. Up to this school I was like any other normal student. But, one incident changed my life to some extent. One day, when I was swinging on a swing suddenly one of my friends came and tried to disturb me. At one instance he tried to pull me from my legs and as a result I defended myself by kicking on to his face. It hurt him and he started to cry. Then I saw his mother coming towards me and she shouted at me. I felt extremely sorry and I was afraid that they will complain to the principal. Although, it did not happen, it changed my attitudes towards people to think twice before dealing with them. Thereafter, I tried to keep my name as a good student in school.

Somewhere in this timeline, my father was transferred to Kaluwanchikudy police area, a north-east territory of Tamil tiger’s. He came to see us occasionally in one or two months’ duration and even that was only for one or two days. I started to mentally suffer the loneliness and as a result I was getting sick frequently. Finally, after around a year’s time, he was able to come back to Colombo.

I could not stay in that school for a long time. My father again transferred to Minuwangoda as the officer-in-charge (OIC) of police and I had to enter to the school Minuwangoda Nalanda Boys Madya Maha Vidyalaya, where I started to acquire some of my skills, like, play a musical instrument. For the first time in my life I found a friend and his name was Erranda. The house we lived had an extremely large garden and it was full with fruits. As a result, I enjoyed the environment so much. When I am looking back I can not remember any other place where I enjoyed that much.

My father again got transferred to Gampaha province as the OIC of police and I had to change my school to Gampaha Gotami Kanishta Vidyalaya. That was the worst school I ever entered. I could not make any friend, because they refused to accept me as a friend. I think it is because I was not with them from the beginning (from grade zero). Fortunately, my father again got transferred to Maharagama police area and as a result I had to enter the Maharagama President’s College.

As usual, we did not stay at Maharagama for a long period. My father again got transferred back to Colombo and my destination was Rajagiriya President’s college. It is then I was in grade 3. Because of the practice of changing schools very frequently, I was very much tired and I started to get mental troubles like afraid to talk to someone else. Fortunately, my
parents did not try to change the schools thereafter even though my father had got several other transferences.

My father’s next destination was Puttalam province as the officer in-charge (HQI) of the Police. He took us everywhere he can. We visited forests, cement factories and so many other places. Those visits helped me to expand my scope of thinking. I saw how he is doing his duties. At the time, my brother was also trying to play with me and I was getting a friend to play with me.

Then again my father was transferred to the Police Headquarters in Colombo. Within a sort period the violations started in Sri Lanka (in 1988). We passed the dates very carefully and my father was very fortunate to stay aside without participating to usual police work. Meanwhile, my brother started his school life in Nalanda College, Colombo. In 1991, my father got promoted as an Assistant-Superintendent of Police (ASP) and transferred to Bandarawela. He was assigned more scope for his work and he had to look after more than six police stations including Haputalle, Ella, Welimada etc. Our quarters was an old guest house. It owned more than 7 acres of a garden and it was surrounded by a tea estate.

We enjoyed our life so much. We had plenty of places to visit. The garden was full with vegetables and fruits. There were many places in the garden I could not explore. But the climate was not attractive. The cold, dew and misty climate disturbed my interests.

While my father was working at Bandarawela, we visited him once in a while, especially when we got long weekends or school vacations. But my mother visited him at least once in every two weeks. After one such vacation, we came back to Colombo by train. My father accompanied us to the train. I saw his face disappearing as our train happened to leave the station. I did not try to see a particular difference in that incident at that moment.

In the coming week I got a strange situation at the school and at one instance I vomited without any reason. I felt something wrong on me but I was not sick. On Friday, as usual, my mother went Bandarawela to spend the weekend with my father. On Sunday, she called us and said that she will be coming back on Monday. On Sunday the 19th of September, 1993 around 9 pm, some police men came to my grandmother’s place, which is next to our home, and informed us that my father has met with a gun battle with some terrorist group and he has
been hospitalized with some minor injuries. I got so excited. I whispered that it is not possible to happen anything bad to my father. But, I was confused because my mother did not give us a telephone call (there was no telephone at our place at that time, but at some other house nearby).

Within a short time, most our relatives gathered and arranged a vehicle to go to Bandarawela. We left Colombo and reached Bandarawela as soon as we can (it is usually a 6 hours journey). We went to one of our relative’s home at Deyatallawa area and as soon as I got there I saw my mother crying hardly. As soon as she saw us, she shouted us saying that my father has passed away. I got shocked. I said “no, that can not happen”. I did not believe her. I do not know how I spent the night. I saw my father’s body next day. It was some plunderers who had come to plunder the restaurant while my father was inspecting a crime scene near by with my mother. Those plunderers had seen my father’s official car and they had misinterpreted it as some rich person’s car. Their plan had been to steel the money from the restaurant and escape from the place using my father’s car. Meanwhile, my father had seen those men threatening the staff of that restaurant. There had been no option for my father other than trying to stop that robbery happing in front of his eyes. So, he had tried to take the revolver out. Meanwhile, one of the plunderers behind him had seen this. My father or mother had not seen that plunderer who had stayed behind. Instantly that plunderer had fired several shots to my father. As a result, my father had received six bullets into his body and two of them had hit his heart. Fortunately, my mother and the driver have survived from the battle and my father had passed away while they were taking him to the hospital.

I did not believe my mother until I verified my father’s death. Until then I felt like he is still in the police and he will come to puck us as usual. But it never happened. The body was taken to our home at Colombo under the patronage of police. Many thousands had gathered to pay there last minute prestige to my father.

For the first time, I felt that I lost my father after I sensed the cold skin of his forehead as a result of a kiss before taking his remains to the cemetery. The funeral was held under the official patronage of Sri Lanka Police. Almost all the state media reported this incident. Finally, our family limited to our home at Colombo. I felt loneliness and lost every hope in my world. I saw my father on every dream I saw. I heard his voice even at daytimes. Some
days I was expecting him, but he never came. My life filled with uncertainty. My mother was crying everyday. But my brother did not get that much of pain because he was too small.

I went to school after several days. Everyone looked at me differently. No one tried to ask me about the incident. Meanwhile, the principal of my brother’s school, the Nalanda College, had informed my mother that he like to take me to his school after considering the security reasons. As a result, in the next day I had to leave my 5th school, where I had studied for more than 5 years, and entered to the Nalanda College, Colombo.

I could not uphold this sudden change. First I lost my father and all the happiness with him. Then I lost my school and all my friends. I could not recover from this shock until I entered to the university. There were days I did not talk even a single word at school. As a result, while I was entering to the university I had difficulties in constructing sentences. Now, I have recovered considerably from that difficulty, but still I have difficulties when defending ideas.

I sat for my O/Ls as well as A/Ls while attached to Nalanda College. Although, my inter-relations are very weak, I was able to sustain as a preferred student by most of my teachers. Since I did not have a single friend, I had more time to do my own work. My mother’s hopes concentrated towards me and she provided me the maximum support she can give me. She was behind me whenever I went to buy chemicals, electronic items or any other thing from a shop. I did not waste anything I brought. I saw the reality of the world. I saw how humans invite trouble for their own selves as a result of restless desires and attitudes. I wanted to do something different for the mankind. My preferred subject was Physics and I wanted to learn Physics at the university as well.

Fortunately, I get selected to the physical stream and I was able to study Physics, Computer Science and Applied Mathematics. After the second year examination the university has allowed us to select our specialization field based on our results. My results made me eligible for selecting among Physics, Statistics and Computer Science fields. Although, my first choice would have been Physics, I selected Computer Science. That was the most deliberative decision I had taken for the first time in my life. There, I had considered my entire future, including my capabilities, job availability and my destination. I am still happy about that decision and now I have been able to go beyond those circumstances by making my path multidisciplinary.
2.3. Skills I Acquired

2.3.1. I am an electrician and an inventor (?)

I wanted to build a robot for a school educational exhibition when I was in grade 7. But, I did not know electronics at that time except arranging bulbs and batteries to light up some bulbs or to rotate a dc motor. But, I felt like I have the potential and I should do something big for that exhibition. So, I asked my father to bring me some motors. However, he brought an experimental electronics book and the parts needed to build the simplest practical of that book. I spend days trying to identify the parts and to develop the circuit. I did not know how an experienced electronic practitioner develops a circuit. My solution was to use a cardboard and connect the parts using wires you find inside a flexible AC wire. Gradually I was able to see the results of my first experiment. I developed a simple multi-vibration circuit, where LED bulbs light up in turn. In the successive days, I was able to develop the night-rider circuit as well. Finally, I developed these creations into my robot which I built for the exhibition. As a result, I got enormous feedback from the public who visited that exhibition. Still I am wondering about the fast learning skills I had those days.

I did not stop my experiments in electronics after the exhibition. I bought more books and parts. The next two years were bad years for me, because I got blamed for my misconduct of breaking most of electronic devices, such as, radios, cameras, etc. not only at my home, but also at other places. But, later I was so worried for these actions, but it helped me to sharpen my abilities. Eventually, I reached to a professional level and I was able to repair many electronic devices ranging from electronic watches to radio sets and more. Before entering the university, I had a complete basic emergency system (lights, intercom, sirens …) designed for my home.

These skills helped me in a later stage of my life to introduce robotics to the UCSC. In addition, now I am developing bio-medical instruments by my own for my M.Phil research.
2.3.2. I am a scientist (?)

After my O/Ls, I have selected mathematics stream for my A/Ls. It included Physics, Chemistry, Applied Mathematics and Pure Mathematics subjects. But, my interests have lain with Physics and Chemistry. I was doing simple experiments related to Chemistry during my O/Ls. But at that time I did not study Chemistry as a subject. For doing experiments, I had allocated a separate space in the store room of my house and filled it with chemicals and apparatus. Surprisingly, I was able to obtain almost all the chemicals needed for doing experiments designed for the Chemistry subject. I knew most of the chemical shops in Colombo and they also knew me. Usually, they do not sell small quantities of chemicals to others, but their policy was different for me. They even did not hesitate to provide me dangerous chemicals. I am thankful to them for supporting for my education.

I did a lot of interesting experiments during my A/Ls. I discovered a lot of things as well. My experiments did not limit to Chemistry. I designed wind power plants, meteorological measuring equipments, etc. However, my existence was hidden from the world. I did not have someone to tell these things or I did not get any other opportunity to show my creations. I had confronted several explosions during my chemical experiments. But, fortunately there were no damage to me. However, I suffered from wheeze. Therefore, after A/Ls I decided to put a full stop for my Chemistry experiments.

Another area which was under my study is astronomy (and astrology). It had become my hobby to read the books and write NASA in USA to obtain photos. I did not have money to buy a telescope. So, I have created several telescopes by arranging lenses. I tried to learn doing calculations of planetary movements, but I could not mark a considerable success in that area.

2.3.3. I became an expert in computer science

My interests changed as I entered the university. I selected Computer Science, Physics and Applied Mathematics as my subject stream for first two years. Among those, my interest chased in the direction of Computer Science. I was not efficient during my first year.
However, during my second year I could do a lot of mysteries!!! with programming, such as, creating computer games, simple operating systems, music generators, and computer viruses. I was one of the favorites of my colleagues and lot of them gathered around me when they get a programming assignment. Finally, I was able to get selected to study under Computer Science special. My final year individual project has helped me to understand what a research is. Even though I loved programming before, after my exposure to research, I could not get away from it. I wanted to continue my studies even after leaving the university. Therefore, after a long term effort I got absorbed to the university system.

2.3.4. I am a musical keyboard player and a composer (?)

I have a long history with music. My parents directed me to learn to play a melodica (a small hand-held wind piano) when I was in grade 1 in school. Initially, I was bit bashful to show that I like to play such an instrument. My parents invested to buy my own melodica even though they where not much stable in finance. With the time, I progressed in the activity and joined the western band of the same school. However, I had to leave the school after a very short period and I did not receive a similar opportunity from any other school. Meanwhile, I received a small electronic organ as a gift from one of my father’s friends and it helped me to put a long step forward. I was able to practice the organ for long hours than the wind piano. My parents tried to teach me music under some private teachers. However, none of them were succeeded in their efforts, because, it was eastern music which they were trying to teach and I was too small at that time to understand the details. Finally, my parents gave up the effort. But, I did not stop practicing the notes with the keyboard. As a result, I developed the skills of play-by-ear.

I did not receive a good formal education in music until I selected Western Music as the aesthetic subject for my O/Ls. However, this education was majored to learning theories and thus I received little knowledge on actual piano playing. After my O/Ls, I did not try to learn music under a teacher. I tried to learn by my own. I developed my skills to perform at some expert level. I could see the spiritual natures of music. I could express my own thoughts and feelings in the form of a music composition. I used to play my organ whenever I am in depressed. Last year I contributed in music to create the CD called “swara rashmi” (see Appendix B) which was an effort of the welfare society of UCSC. This year I have advanced
one step forward by publishing some of my own compositions through the web. These creations can be accessed by visiting my personal website, which is available at:

http://ucsc.cmb.ac.lk/People/hbe

I am not reluctant to accept that I am not an expert musician or a composer. There are limits for my understanding in music. Still I do not know how to compose a music by using more than one instrument at a time, how to select them etc. But, I know that I can explore some of these areas during my lifetime.

2.3.5. I am becoming a philosopher (?)

From my childhood, I saw things differently. But after my father’s death I had a period where my thinking has been curved towards my inner cognition or I have developed my meta-cognitive skills. I did not talk much with others or I had limited interactions with people. I wanted to realize my dream of becoming a scientist in Physics. I heard about the well known scientists in the history, like, Einstein and Marie Curie and I tried to find their life stories. I realized that none of them had tried to bring comfort for their lives, but they strived to advance the science in the world. I read a lot of books to find details about scientific discoveries. One time, I wanted to understand the universe. So, I started to read the details of astronomy and astrology. I wrote letters to NASA in USA and they sent me pictures of planets and other systems. Even though most of the knowledge I touched at that time were beyond my understanding, I could understand how scientific experiments and carried out and how scientific discoveries happened. The scientists had failed many times before they achieve their actual discovery. It is the indefatigable effort you need in the correct direction.

I could not work for such an effort as I had to study for several examinations in order to enter into a university. Even after entering into the university I had to work hard to get my degree. So, I was indefinitely postponing and compromising my own consciences to assure my sustainability, because I had to look after my family at one hand.

I happened to specialize in the area of Computer Science. However, I still needed to study other sciences. Fortunately, my M.Phil study helped me to see beyond the area what I have specialized and as a result I entered into the area of cognitive science. The cognitive science
is explained as an interdisciplinary study of mind and intelligence. It combines the knowledge components of Psychology, Philosophy, Artificial Intelligence, Neuroscience, Linguistics and Anthropology. In addition, I am developing my knowledge in the areas of robotics, electronics and music as well.

Collectively, my interdisciplinary approach is helping me to see big pictures of the world and in work I am doing. Sometimes it is hard to prove that I am efficient and effective, because if someone has specialized on one aspect, that person might defend well when a question falls into his/her specialization area or that person would use the logic that inspired to that person from the discipline he/she has specialized. I believed the scientific approach until recently. But it has made me blind sometimes when I try to explain things, such as, existence of creatures, supernatural events or the emotional flow of a poem. Some explanations suggests incorrect decisions if we use only logic. Therefore, now I am trying to understand things in a spectrum of angles.

Since 1950s, scientists were trying to understand the structure of human cognition and they adopt a divide-and-conquer approach, where it involves focusing on specific aspects of human cognition and trying to understand in detail what is happening in those aspects and finally put them all together into a single theory. In 1972, at the Carnegie Symposium, Allen Newel raised the question of whether this strategy was really working in his “You can not play 20 questions with nature and win” paper. In it, he lamented the tendency of cognitive psychology to divide the world into little paradigms each with its own set of questions and logic. Each seemed to manufacture an endless stream of research without the overall picture of human cognition becoming any clearer (Anderson and Lebiere, 1998). This makes it clearer that it is not enough specializing one specific aspect (or area) as you develop your knowledge. Instead, you should always try to acquire a complete set of skills in order to give a complete answer to a research question or any other problem.

I am using my websites to express my views and thoughts on existences. But still I can not guarantee that those are ‘complete’. The knowledge I have gained through out my life time is negligible respect to the existing knowledge in the world. The knowledge is relative to the time we live. J.J. Gibson, a very controversial cognitive psychologist, says that “the world is its own best representation” and he postulated the existence of affordances, which are perceivable potentialities of the environment for an action. If we want to sit, we go for a
chair. It is not because we use our vision to perceive the structure of a chair and then analyze that against our desire to sit. But it is because a chair affords sitability. Even a table can affords us some sort of sitability. After discovering affordances, robotcists have now been able to develop lot of skills into robots without putting much effort on traditional computationally expensive vision processing systems. So, this is a one instance where we should always try to remove our glasses of traditional scientific approach and wear new glasses to see things clearly and differently.

I have compressed lot of thoughts in the above text and I am in doubt whether they are clear to a second party. I would welcome comments on my writing, my ideas or anything which could ultimately improve my existence and its usability to the world.

2.4. Maslow’s Needs Hierarchy and My Moral Obligations

As I developed with my inferencing capabilities, since I was around 12, I tried to understand the world and people. I saw people with different characters. Even though I wanted to keep some persons as models to emulate them to model myself, soon I had to replace those persons after seeing unjustifiable actions of them. I could not even promote my parents to that place, because sometimes their behaviors are not that accurate.

Then I started to read about history where I can find good models to follow. I found scientists, philosophers, kings and different kinds of people those who have influenced the history. But still I was not satisfied, because none of them describes ‘perfection’. There were days which I allocated my interval time of school to follow someone else to see how they are spending their interval time (some days I have been traced by them and got blamed). But still I realized nothing.

However, my religious background as a Buddhist constrained me preventing me from selecting a wrong path during my exploration days, otherwise if I had satisfied with a wrong role model, I would have emulated that model destroying my whole future. I was morally obliged to the following five basic percepts:

- To refrain from taking life (i.e. non-violence towards sentient life forms)
- To refrain from taking that which is not given (i.e. not committing theft)
- To refrain from sensual misconduct (abstinence from immoral sexual behavior)
- To refrain from lying (i.e. speaking truth always)
- To refrain from intoxicants which lead to loss of mindfulness (refrain from using drugs or alcohol)

The education has helped me to improve my rational thinking. I could understand that a man is just an instance of human being and no man can become perfect. It is only by one’s judgment after thinking, which differentiates correct from incorrect or good from bad. But this judgment is depended upon the environment circumstances, their experience and moral obligations. Since, no two persons are entitled for identical settings of these, their decisions are also not identical. Therefore, I could see the great intense to correctly interpret environment circumstances, my experiences and moral obligations to correct my decision making abilities. I saw that the science on one hand and my understanding of Buddhist philosophy in other hand can lead me to my objective. Since science is a widely accepted philosophy of the world, the decisions led by the science are almost always accepted by the society; but science alone does not interpret things correctly. It does not describe good in contrast to bad. The scientific explanations are only limited to the physical world and yet it has failed to explain one’s psychology other than based on behaviors. The religious explanations on the other hand are only accepted by a group, because there is more than one religion in the world and even with religion different people interpret things differently. In contrast to science, most religious teachings can explain psychology and beyond that. Since, the sustainability of a society is determined by thinking machines (humans), it is apparent that both these philosophies are needed for a goodwill of a society at individual levels.

Maslow’s holistic dynamic needs hierarchy (Maslow, 1943) is an attempt to represent this human motivation from physiological to psychological in a hierarchical manner. It starts from more primitive needs of a human, such as, breathing or drinking water, and then it explains how the needs are developed as the low level needs are satisfied. As a result, a man would finally looks for spiritual satisfactions.
Figure 1: Maslow's holistic dynamic needs hierarchy (source Wikipedia)

From the descriptions I have presented so far, it is clear that I have been able to touch the self-actualization level to some extent even though Maslow explains that higher needs in this hierarchy only come into focus once all the needs that are lower down in the pyramid are mainly or entirely satisfied. I think it is because I have been able to constrain my other needs by constraining my desires over the years. As a result, I am practicing a minimal lifestyle. I am satisfied with the salary I get. I am not trying to compromise my leisure time by investing it to earn more money. I am living with the nature. I play music. I have a smooth lifestyle. I am a free thinker.
Chapter 3. Foundations for Being an Effective Academic

After deliberately reading this chapter the reader will be able to (but not limiting to),

- Recognize the value of scholarship, professionalism and ethical practice
- Describe how CTHE has influenced the author to change his teaching and learning attitudes
- Identify the learning philosophy of CTHE
- Recognize SLAIHEE and its mission of improving higher education in Sri Lanka
- Evaluate commitments and achievements of SEDA outcomes and values

3.1. Introductory Remarks

From the days of my childhood I had an ambition to become an academic, more specifically a scientist (read chapter 2). I got to know that there is a formal training given to school teachers after I saw some guest teachers being examined by a panel of judges. However, I experienced a different learning environment during my university life. Compared to school teachers who are very much curious about the background details of students, the university lecturers are passive in the sense that their only concern is supplying knowledge to students. Although it was very uncomfortable at the beginning, later we adapted to the environment.

I have been exposed to many lecturers during my university life and experienced a wider spectrum of learning environments (teaching methods). I am not happy about all the learning experiences I have experienced. Still I am unhappy about inefficient assessment mechanisms some courses had enforced, because they did not allow me to demonstrate my skills at peak. I still do not know why I studied some subjects, because those lecturers failed to clearly convince the outcomes and to bridge the knowledge in the curriculum. Therefore, I thought, if I become a lecturer one day, I will change myself until I can make my students happy about what they gained at the end.
However, as I approached to lecturing, I realized that effective lecturing is not as easy as I thought. I have tried some different lecturing techniques, but concluded that I have not achieved the levels I expected at the end. Meanwhile, I heard about the CTHE course, which is conducted by staff development centr (SDC) of University of Colombo and I was in a great interest to follow this course and fortunately I was able to follow it. While I was following CTHE, I heard about Sri Lanka Association for Improving Higher Education Effectiveness (SLAIHEE) and I obtained the membership and attended the 2007 conference. This chapter discusses how these experiences helped me to improve my teaching and learning as well as other academic activities.

Finally the chapter discusses my achievements of SEDA outcomes and commitments to SEDA values.

### 3.2. CTHE Course and its Reflections on Me

I was counting the days to attend the first workshop of the CTHE course (and continue), because I heard from my seniors who followed the course that it helps a lot in understanding the teaching and learning philosophy. But I was wrong. The CTHE course had 15 workshops and those workshops have been divided to 5 units, where the foci were:

- Preparing to teach
- Developing reflective practices on being a university academic
- Interpersonal skills and group work
- Becoming an effective academic
- Seminar presentations by participants

Professor Suki Ekaratne was the course tutor and Mrs. Shrinika Weerakoon supported him. The first few workshops supplied us enough literature about learning and teaching and the learning culture looked similar to a typical workshop. However, later the culture started to change gradually deviating what I expected. The course tutors gradually disappeared in the audience and participants became apparent on the stage. Later, I learned that this is what expected at the course. However, the learning environment was really enjoyable and it was the first learning experience I received after leaving the University with my first degree.
The following are some of my reflections I have recorded after some workshops I had participated:

**Day 1: Unit 1 (November 24):** Although I have been to the premises several times, I was really immunized from the first impression I experienced. I walked there with my friend Upali and at the entrance there was a whiteboard where some instructions were written in. The instructions said what we have to do when we go through the place: put a signature on the attendance, collect the hand-outs, etc. It was the first time I saw how a smooth flow can be introduced, otherwise they would have placed a paid person to monitor or guide others.

As we entered the class room we saw that the session has already started. Our tutor, Professor Suki, and Mrs. Shrinika warmly welcomed all of us to the course. The first activity started with an introductory round, where everyone had to introduce someone else to others (Nalin in my case). After enjoying that activity we sat on with our College House group. There were five, Samantha, Sajeewa, Hashendra, Prabha and myself in our group. Meanwhile, our Professor introduced us the philosophy behind grouping:

- Forming followed by Storming followed by Norming followed by Performing. As soon as a group is formed, a storm of curiosity develops on them to get to know each other. As a result, they start dialogues and after sometime they return back to the work they have to be performed under the group spirit. If a new comer joins with a group, (s)he would get discriminated because (s)he has been absent for initial steps

Among the other things we discussed during the session,

- The aims of the course and importance of SEDA accreditation
- Kinds of knowledge and their interrelationships
- Kolb reflective cycle and snowballs
- Bloom’s taxonomy and learning outcomes
- Learning agreements and selecting a mentor
Day 2: Unit 1 (December 01): Today the most interesting lesson we learned is how to carefully design learning outcomes for a course. Sometimes we list learning objectives, however, most of the time they are not achievable or achieved at the end. Therefore, the learning outcomes are defined at the beginning, estimating what skills the students shall possess at the end of the course. During this effort we referred Bloom’s taxonomy and Biggs’s SOLO taxonomy. Further, all the activities and assessment should be perfectly balanced and aligned according to these outcomes. This is called Constructive Alignment and this could be applied to many levels: for a single lesson, for the whole course or for the entire degree program. Meanwhile, we engaged in writing learning outcomes for one of our own courses. A new member, Ravindra, joined our group today.

Among the other things we discussed during the session:

- Active learning and student engagement dialogue
- Norm and criterion reference marking of assessments followed by an essay marking exercise
- The SQ3R method of learning

Day 3: Unit 1 (December 08): Today we have done something interesting, a group poster exercise. We had to prepare a poster expressing “A portfolio is like climbing a mountain”. From this I saw the strength of a group in a challenging and cooperative environment. Therefore, I planed to incorporate this method to my teaching and assessment practices.

Among the other things we discussed during the session:

- Socratic learning
- Addressing plagiarism
- Assessment issues
- Portfolio writing

Day 4: Unit 1 (December 15):
Today I submitted a table responding to last session’s homework which was constructed by identifying 5 main problems/issues encountered in my learning and teaching. Two column headings have been predefined as main problems/issues encountered in my learning and teaching and possible solutions. I extended it by adding the column headings underlying
theory supporting the expectation, the first piece of work to be carried out and what advantages I would gain as the result. As our course tutor emphasized, this could be used to identify future learning agreements.

Among the other things we discussed during the session,

- Students could be motivated to ask questions by first giving them a challenge. As a result they would request your support, which will eventually create a dialogue
- The 3P model of Biggs
- How lecture breaks could be effectively used to enable active learning. The lecture breaks are necessary component of a lecture to regain the attention of students while they are in attention fall cycle (normally after 15 minutes). Pre-planning of a active lesson would help to do this in a consistent manner
- Presentation panic could be avoided by addressing the factors that are critical for effective teaching and presentation. Language, opening, structure, clarity, signposting, interest and ending are among them. (a group presentation followed this to support an active learning environment)

Day 5: Unit 2 (January 05):

This is the first workshop of the New Year. Our tutor, Professor Suki, started the discussion introducing the importance of episodic reflective thinking in both the professional and personal lives. Episodic could be each year which triggers or provide circumstances to make things happen. It can be thought in two forms: reactive and proactive. One interesting application would be “How can we make the students reactive such a way that learning can take place?” He also reminded a quotation of Mahatma Gandhi which says “Eye for an eye makes the whole world blind”

Among the other things we discussed during the session:

- The values and goals, and their relation to beliefs, attributes, behaviors, goals and tasks. The congruence tree diagram explains it as a tree model. It is very difficult to identify one’s personal values by self; therefore, a criterion could be used. The life path chart is a one way of identifying one’s turning or critical points in his/her life, and then values and goals in a reflective manner. As our tutor mentioned, values are
very much helpful when responding to someone (if the values are established, the reactions are instant)

- Newman’s article on university education is an excellent description to identify one’s values and goals in teaching
- It is a good practice to properly write abbreviations in serious writing, for instance, you should write “can’t” as “cannot” in serious writing
- Having a team name, a team logo and a team slogan or motto is advantageous for a team to operate in unison: this was followed by a group exercise to find ones for ours. Our group selected “daydreamers” as the team name, a tear drop with a moon face as the team logo and “first love for ever” as the team motto. I was not comfortable with the selection, because I could not find a sound grounding for their meanings. Therefore, I saw the intense to reflect the change “I should express my agreement or disagreement openly” into my values! (see section 9.3.6)

I have attended all the fifteen workshops of the course and participated to all the activities which have been worked during those workshops. In addition, as I had planned (see section 9.3.3) I was able to submit fifteen learning agreements and implemented almost all of them. I started writing my portfolio somewhere around February and as a result I could submit four chapters and received feedback before the final submission. Therefore, I could finish this portfolio on time while presenting most of my related work, because my organized nature of work (see section 9.3.7 as well).

3.3. SLAIHEE 2007 Conference

I heard about Sri Lankan Association for Improving Higher Education Effectiveness (SLAIHEE) while I was following the CTHE course. I have obtained the membership as well and participated the conference. The conference theme of 2007 was “Developing Skills in University Lecturers and Students”. The conference was followed by keynote speakers and paper presentations. One keynote speaker really inspired me as well as others, which was done by Mr. Deepal Sooriyarachchi. He was able to took us beyond our fixed mindsets to see things rationally. One thing I learnt from paper presentations is that the changes you propose to your teaching and learning could be small or only a small step at a time. Thereby you will
be able to manage them carefully and you can analyze their results to identify what can make you better.

The SLAIHEE is another initiative of Staff Development Centre (SDC) of University of Colombo, a national organization committed to improving life skills and performance capabilities of university teachers and students. More information can be obtained by visiting the official website:

http://www.slaihee.org
3.4. Reflective Practice and Kolb Learning Cycle

This chapter has described by commitments towards being an effective academic by participating to workshops and conferences. CTHE has changed my attitudes towards teaching. Earlier my belief was that the teaching is one person's show while students are listening. However, after my CTHE exposure I have recognized that learning can happen at different levels and self reflection is the most effective learning of all. I have recognized the Kolb Learning Cycle (Kolb, 1984) (CTHE course handbook) which is represented in figure 2.

![Figure 2: Kolb learning cycle](image-url)

- **IMPLEMENTATION**
  - Concrete experience
    - Participation
    - Doing

- **PLANNING**
  - Active experimentation
    - What to do next time
    - Setting goals
    - Identifying criteria for success

- **REFLECTING ON OUTCOMES**
  - Reflective observation
    - Saying what you did without being judgmental
    - Observing the process

- **MAKING SENSE**
  - Abstract conceptualism
    - Making judgements
    - What worked well, and why
    - What didn't work so well, and why
    - Linking theory with what you did
The learning is not straightforward. This is even evident in babies. Babies appear in the world with very limited innate knowledge. However, with the time they develop the skills as a result of reinforcement learning, which is again a reflective practice. The Kolb Learning Cycle stresses this in an elegant way as in figure 2.

This portfolio has written demonstrating my commitments on this reflective practice. This reflective practice fulfills my achievements of following SEDA outcomes:

✓ **identify** your own professional development goals, directions or priorities
✓ **plan** for your initial and/or continuing professional development
✓ **undertake** appropriate development activities
✓ **review** your development and your practice, and the relations between them

In addition, this chapter demonstrates my commitments towards upgrading my professionalism as an academic through participation to training programs and conferences, and obtaining membership of associations. Therefore,

✓ **inform** your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
✓ Scholarship, professionalism and ethical practice (SEDA value)
Chapter 4. Development of Educational Processes and Systems

After deliberately reading this chapter the reader will be able to (but not limiting to),

- Recognize the value of the development of people and educational processes and systems
- Describe SWOT analysis to estimate the readiness of the environment and people
- Recognize professional ways of eliminating resistance
- Evaluate commitments and achievements of SEDA outcomes and values

4.1. Introductory Remarks

This chapter describes the effort I put to introduce the areas Robotics and Embedded Systems into the curriculum of our institute. The effort was not straightforward and the whole process took more than three years to reach to its goals. First, I had to analyze the circumstances to determine the readiness of people and the environment. When it was ready, I prepared a plan and executed some focused activities to remove possible resistance. Ultimately, I have achieved my goal and came up with an outline for the course. This chapter elaborates this effort and discusses why my effort is worthwhile with respect to SEDA outcomes and values. The successive chapters continue the story by discussing how I have put my efforts to align the newly introduced course module with effective learning and teaching practices.

4.2. Estimating the Needs and First Triggers

The story began with my disappointment about the current study programme of our institute. The reason for this was that I felt like our concern as an institute is only towards software related areas. Software is not tangible. It is about instructions and data you feed or receive from a computing system. But when it compared with other big universities, there focus is broad. They have courses like robotics, embedded systems, real-time systems, mobile
programming, device programming, etc. where the concern is not only on software, but also on how that knowledge is applied to specific hardware.

I believe that it is a violation of a human right if we try to measure a person by casting him/her to a frame defined by an individual or a group. Most students have lots of other skills even though they happen to fall under some study program. Sometimes they select it because they do not know how to select and so they seek for guidance from someone else; sometimes it is their choice because they know that they can achieve their expectations form that selection. Very rarely they select it because there is no other option which can best cater their needs like in my case. I have seen many such instances where students had lots of other skills, but they are unable to demonstrate their capabilities because of narrow curriculums. Thus, it is our responsibility to identify the current trends in students’ skills and requirements by the industry sector and improve our curriculum while aligning it under our vision as well.

I have demonstrated my skills including electronics and some other areas. However, I have been exposed to computer science subjects during my specialization years. I wanted to do a interdisciplinary research project for my final year project applying my computing skills to some other area. However, I could not achieve this objective because I had to depend on what my institute can serve me. I realized that if I try to do a project of my desire, I will not be able to find a supervisor or I will not be able to defend effectively. Finally, I selected a topic which is possible or have expertise within my staff.

After I joined the staff I could see an overall view of the academic systems and processes. I saw two options, either I should adapt in the current system and let it go as it is by doing nothing new. This is the safest when concern to my career. The second option I saw was to contribute someway to improve the system to make it better. This is riskier and sophisticated because the “better” is interpreted differently by different people. Therefore, I spend considerable time studying attitudes of our staff members to get an idea of how they see and interpret things.

One day, while I was rethinking about my past and re-planning the future, I got an idea “can I change the current system by introducing robotics?” However, at glance I thought it is a stupid idea as it is up to senior academic staff to take any decisions regarding the university system, and as a result, I did not develop this idea as I did not see any strong triggering factor
as such. In a later day, while I was participating in a staff meeting, I heard our director is asking about the progress of robotics syllabus from one of our staff members. That excited me a lot. I realized that it is now the time to put my full energy to contribute to that effort. I saw the readiness of the environment and persons (Presage of 3P, Biggs, 1999). Soon on the following day, I met that staff member, who was Dr. Kasun de Zoysa, and told him about my intention. Since he had only little exposure to that area, he asked me to take the responsibility of designing a possible course for our students. I grabbed that challenge without any doubt.

4.3. Feasibility Study and Skeletons

My first step was a SWOT analysis (CTHE course materials):

**Strengths:**
- Since our students are from mathematics stream they already have logical and analytical thinking
- It will not be necessary to concentrate on details of some topics, because the students are already receiving computing knowledge from other subjects
- I do not have to worry about students’ participation to the course, because they already have a great interest for this area
- We already have some few staff members who have done some activities in the area, for instance, Dr. Kasun had participated to one of micromouse robotics competitions during his undergraduate studies
- Dr. Kasun has a micromouse robot and he likes to donate it for the sake of the course

**Weaknesses**
- No one of our staff including me has learnt robotics as a subject
- We do not have a separate place (a laboratory) for conducting robotics practicals
- The staff in general is still unaware about the course and its industry relevance

**Opportunities**
- There are lot of resources in the Internet about similar courses
- We can gain extra knowledge by participating to external workshops
• We can buy some robotics kits (I have already identified a local agent who can supply LEGO robots)

**Threats**

• Other faculties/universities would see our advancement as a threat for them

• Resistances can come from our own staff

After analyzing these issues I came up with a skeleton for the course and presented it to Dr. Kasun and eventually to the director. The director was so happy with the way the course has been designed. In that I included a road map about my plan for next two years, hardware requirements, etc. This way, I have successfully accomplished the first step of my mission by retaining the trust of the chain.

Meanwhile, one undergraduate student came to meet me and expressed his desire to do a robotics related project. At once, I expressed my reluctance, because no one has done a robotics project earlier in our institute. The staff is not aware about the area, so it would become difficult to successfully face the project defense. However, I wanted to accept this as a challenge and allowed him to carryout his project under my supervision.

**4.4. Addressing the Resistance**

Yet the deal was between me, Dr. Kasun and the director. This deal is not enough if I want to really implement the course and its circumstances. The course had not yet included into the curriculum. To really convince the need for such a course I have to address department heads, academic coordinators and other decision/policy makers. To realize this, I have used the following techniques:

• Start an email conversation with academic staff – There I have explained the benefits our students would receive if we incorporate the area into our degree program. This also included a roadmap demonstrating what we will be able to achieve as an institute at the 21st century
- Seminars to staff – I have conducted two seminars showing them some demonstrations, my readiness to teach the subject, and benefits to students and to the institute.

- Achievements of first robotics project – It was surprising that the first project in the area of robotics and the first project I have supervised have received an “A” grade. In addition, it had awarded the Prof. V.K. Samaranayake prize of the best paper presented in the 8th International Information Technology Conference.

- I have supported some group projects in robotics area and they presented their work in the Infotel exhibition. This had become one of the most attracted item in the stall and received many votes from spectators.

These activities and achievements had contributed to eliminate the resistance. As a result, I was able to reach to my goal of incorporating robotics as a subject to our curriculum. The subject has been registered as *Applied Robotics and Embedded Systems* with the module code SCS 4013.

In the meantime, UCSC has allocated a hall for two laboratories: Robotics and Ubiquitous Systems Laboratory and Wireless and Sensor Network (WASN) Laboratory. I have been appointed as the coordinator of the Robotics and Ubiquitous Systems Laboratory, while Dr. Kasun had been appointed as the coordinator of the WASN Laboratory. This was a good start for both of us because both of us have similar intensions. In addition, the UCSC has supported to purchase some robotics kits as well (there is a long story for this effort as well). Ultimately, my overall effort was worthwhile and I have achieved the most difficult part of the work.

### 4.5. Learning to Teach

Now, the responsibility is on me to teach the course to others. So far I have demonstrated only practical knowledge on some aspects. If I really want to teach, I should organize my knowledge into topics and I have to enrich it with theoretical stuff as well. I have consulted following in that effort to formulate the knowledge into a well-defined structure.

- Participated in related workshops
4.6. Spreading the Message

Now, the course is listed under the curriculum. My next mission is to spread this message within students to gather some potential students to the course. The course is optional and offered only for 4th year computer science special students. The available resources have constrained the maximum number of students to 20. Fortunately, there are only 13 students in the batch, so there will not be a competition.

As the first step, I have done a workshop for students, which has been organized by the computer science society. Dr. Kasun also forwarded some students who have been asking him for hardware related projects. I never tried to lose any of those students and it was a kind of marketing strategy.

Within a short period of time I could see the results. More and more students came asking about the course and about projects. Students’ enthusiasm was apparent from the final year projects, out of 13 students of the batch 4 students have been enrolled for robotics related projects.

The following summarizes different appearances of the area:

- Course module SCS 4013 (Applied Robotics and Embedded Systems)
- Research projects under 4th year individual project
- Literature survey of 3rd year
- Student research groups
- Student organized workshops

At the time I was writing this section, I have successfully finished teaching the course subject SCS 4013 for the first time. There were 8 students (batch of 13 students) who have followed
the course. They were really enjoyed the subject and it is apparent from their feedback and how they contributed to improve the laboratory appearance.

4.7. Reflections and Commitments to SEDA

This chapter has described one instance where I put my effort to develop the educational process and system of our institute, i.e.

- **contribute** to the process of module/program design, implementation and evaluation (SEDA outcome)
- The development both of people and educational processes and systems (SEDA value)

The need for contribute to such an effort was triggered as a result of reflections about my experience with the institute. There I identified that the current curriculum is not sufficient to fulfill the needs of students as well as the society (section 4.2). Then I planned how I should contribute to the development of the system (section 4.3) and then I have undertaken some actions (section 4.4) to realize my plans. This process was not straight forward and I had to revise my plans to better organize my efforts each time. This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

- **identify** your own professional development goals, directions or priorities (SEDA outcome)
- **plan** for your initial and/or continuing professional development (SEDA outcome)
- **undertake** appropriate development activities (SEDA outcome)
- **review** your development and your practice, and the relations between them (SEDA outcome)

I do not like to consider that this effort is enough to make the curriculum perfect. When compared to top level universities in the world we are still behind the needs of the world. Many people are quite smart to say “we can not do it here; because we do not have resources or funds”. But I interpret this as lacking of commitment. Now the world is developing computers that can even think and computers that can be controlled by thought of humans. At glance this looks like science fiction, even it is not. My next intention is to explore those and
introduce them into our study programme to make it up-to-date. So that we will be able to face the future as a modern society in the world through our younger generation. Therefore,

- Continued reflection on professional practice (SEDA value)

All the strategies I had used in this effort, such as, SWOT analysis, seminars, discussions, are justifiable under my professionalism (sections 4.3 and 4.4). Therefore,

- inform your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
- Scholarship, professionalism and ethical practice (SEDA value)

The ultimate beneficiaries of my effort are students. As a result of this change, the students are now doing robotics related projects for their final year project and they have a separate laboratory to do experiment (section 4.6). Therefore,

- extend your use of learning, teaching and assessment approaches (SEDA outcome)
- provide support to students on academic/pastoral issues (SEDA outcome)
- Working in and developing learning communities (SEDA value)
- Working effectively with diversity and promoting inclusively (SEDA value)
Chapter 5. Course Design and Constructive Alignment

After deliberately reading this chapter the reader will be able to (but not limiting to),

- Recognize the value of the development of people and educational processes and systems
- Describe constructive alignment in terms of learning outcomes, learning activities and assessment
- Design learning outcomes for a course while applying learning theories, such as, Bloom’s taxonomy and SOLO taxonomy
- Evaluate commitments and achievements of SEDA outcomes and values

5.1. Introductory Remarks

The focus of this chapter is to describe my efforts of designing the course module Applied Robotics and Embedded Systems (SCS 4013) while applying learning theories we find in literature, such as, constructive alignment (Biggs, 1999) and Bloom’s taxonomy (CTHE course notes). The effort has been accompanied through several learning agreements.

First, I practiced designing learning outcomes for the course, but not learning objectives. Learning objectives are outcomes we just hope to accomplish, but we will not be accountable of fulfilling them or we will not try to verify that we have accomplished them. If we state learning outcomes at the beginning, we can work towards them and students get to know what skills they will acquire at the end.

After, designing learning outcomes, I have designed some laboratory practicals as learning activities while aligning them with the outcomes. In addition, there are some more learning activities I have designed, such as, in-class exercises, to achieve those outcomes. Finally, I have designed the assignment criteria, such that, it also aligning with the learning outcomes (discussed on Chapter 7).
The final focus of this chapter is to discuss my achievements of SEDA outcomes and commitments to SEDA values.

5.2. Learning Outcomes

Biggs (1999) suggests that one of the keys to successful learning is an aligned curriculum: this means that learning outcomes are clear, learning experiences are designed to assist student achievement of those outcomes, and carefully designed assessment tasks allow students to demonstrate achievement of those outcomes to some level of sophistication or depth in Bloom’s and SOLO taxonomies (CTHE course notes).

![Bloom's taxonomy](image)

**Figure 3: Bloom’s taxonomy**

The first two columns in the Bloom’s taxonomy (figure 3) are related to passive (sometimes active) learning and other columns are related to active learning. When I was designing the learning outcomes, I have carefully selected to which level I could be able to take the
students’ learning. My target was up to synthesizing level, where students should be able to design a robot system for a specific task. In addition, I have aligned other knowledge components in respective levels where I like to see their achievements.

Another aspect behind Bloom’s taxonomy is that, he has carefully selected the worlds that represent levels of knowledge while making them measurable. For instance, the first column represents just knowing and to measure whether a learner has that ability the teacher can ask to list some items. However, there is a difference in the second column, that is, you can never ask whether the learner has understood some concept. Because, the word ‘understand’ is so general. Instead of that word, you may ask to describe something.

To reflect this way of designing a course, I have arranged the learning outcomes of the course SCS 4013 as below and it has been discussed under my Learning Agreement Number 01 as well.

<table>
<thead>
<tr>
<th>After successfully completing this module students will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• describe the internal architecture of a microcontroller in terms of functional modules,</td>
</tr>
<tr>
<td>• program a basic PIC microcontroller to do simple tasks,</td>
</tr>
<tr>
<td>• describe the engineering design of a robot,</td>
</tr>
<tr>
<td>• design LEGO robots with various mechanical, electronic and sensor controls,</td>
</tr>
<tr>
<td>• apply a broad range of concepts in the field of AI to program a robot,</td>
</tr>
<tr>
<td>• identify the underlying techniques behind real-word embedded and robotics systems design</td>
</tr>
</tbody>
</table>

These descriptions are also included in the course handbook of SCS 4013 (see Appendix B) and communicated to students as well. Moreover, coming chapters discusses how these learning outcomes have been consulted when designing learning activities and assessment methodology.

### 5.3. Learning Activities

I have identified three forms of learning activities I can enable for SCS 4013:

- Laboratory practical sessions
• In-class activities during lecturing
• Activities for assessment

All the activities which I have designed for SCS 4013 fall into one or more learning outcomes, which I have listed in the above section, i.e. they are aligned. I have implemented six laboratory practicals (Initially I hoped to do few more, but I was constrained to time and resources):

Lab 01: Interfacing PC Parallel Printer Port to Control LEDs
Lab 02: Control a stepper motor through a computer
Lab 03: Program a microcontroller to control an array of LEDs and a stepper motor
Lab 04: Program a LEGO Mindstorms robot
Lab 05: Implement Subsumption Architecture in a LEGO Mindstorms Robot
Lab 06: Forward kinematics exercise

The learning outcomes of laboratory practical 01 are:

• Describe the electrical characteristics and pin configuration of the parallel printer port
• Describes the options available for accessing printer port from a user program under various operating systems
• Write a user program, using C, to interface the parallel port
• Apply creativity to drive a LED panel connected to the parallel port to display patterns

and, these second level learning outcomes are inspired by the following learning outcomes:

• program a basic PIC microcontroller to do simple tasks
• identify the underlying techniques behind real-world embedded and robotics systems design

More details about laboratory practicals can be found by reading the section 7.5. In-class activities have been designed to restore attention while students are engaged in a passive learning, thus to make the learning active. In addition to bring active learning by small group discussions. A complete description of how I have approached this concept is included in the next chapter.
Finally, the assessment methodology is also based on learning activities, for example, group projects and individual poster activities. Chapter 7 elaborates this discussion while presenting how it has been aligned against learning outcomes of the course.

5.4. Outline Plan of the Course

After designing learning outcomes, my next step was to put them all together and produce an outline plan for the course, SCS 4013. The following gives its structure:

**APPLIED ROBOTICS AND EMBEDDED SYSTEMS (SCS 4013)**
(Optional Module)

*Introduction*

This course gives an overview of embedded systems and robotics in practice and research with topics including microcontroller programming, components of robots, robot control and dynamics, motion planning and navigation, and robot learning. During the course, students will use LEGO beams, plates, gears, motors, microcontroller boards and various sensors to construct robots.

**Course Title:** Applied Robotics and Embedded Systems (SCS 4013)

**For Whom:** 4th Year Special Degree Students

**Maximum Number of Students:** 20

**Number of Lecture Hours:** 30 hours (2 hours x 15 Weeks)

**Number of Practical Hours:** 30 hours (2 hours x 15 Weeks)

**Number of Credits:** 3

**Prerequisites:** A familiarity with basic electronics and programming

**Objectives:**
Familiarize with the concepts and techniques in robot control and be aware with the future trends to evaluate and incorporate robots in engineering systems.

**Learning Outcome:**
After successfully completing this module, students will be able to:

− **describe** the internal architecture of a microcontroller in terms of functional modules,
− **program** a basic PIC microcontroller to do simple tasks,
− **describe** the engineering design of a robot,
− **design** LEGO robots with various mechanical, electronic and sensor controls,
− **apply** a broad range of concepts in the field of AI to program a robot,
identify the underlying techniques behind real-word embedded and robotics systems design

**Tentative Schedule and Detailed Syllabus**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lessons and Content</th>
<th>Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td><strong>Introduction to Microcontrollers</strong></td>
<td>Write a C program to control an array of LEDs through computer’s parallel port</td>
</tr>
<tr>
<td></td>
<td>Microprocessors and Microcontrollers, Microcontroller Architecture and Families, Memory, Addressing, Clocks and Timing, Instruction Sets and Instruction Execution</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td><strong>Microcontrollers and Programming</strong></td>
<td>Program a microcontroller to control an array of LEDs</td>
</tr>
<tr>
<td></td>
<td>Assembly Language Programming, Programming Tools, Programming in C</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td><strong>Microcontrollers and Programming</strong></td>
<td>Program a microcontroller to control a stepper motor</td>
</tr>
<tr>
<td></td>
<td>Interrupts, Memory and I/O, Timing and Scheduling</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td><strong>Microcontrollers and Programming</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Serial and Parallel Communication, Signals, Digitalization, Device Interfacing, Power Requirements</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td><strong>Introduction to Robotics</strong></td>
<td>Experience the robot kits and programming</td>
</tr>
<tr>
<td></td>
<td>What is a Robot? A Brief History, Robotics Paradigms</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td><strong>Components of a Robot</strong></td>
<td>Develop a simple reactive robot that can respond to touch and light</td>
</tr>
<tr>
<td></td>
<td>Sensors, Effectors and Actuators</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td><strong>Robot Control and Dynamics</strong></td>
<td>- Group project -</td>
</tr>
<tr>
<td></td>
<td>Robot Action: Locomotion and Manipulation, Kinematics: Open-loop, Closed-loop, DOF, COG, Workspace</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td><strong>Robot Control and Dynamics</strong></td>
<td>- Group project -</td>
</tr>
<tr>
<td></td>
<td>Kinematics: Dynamic Stability, Stable Walking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Robot State: External and Internal State, State Space, Sensor Fusion and Pre-processing</td>
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</tr>
<tr>
<td>09</td>
<td><strong>Robot Paradigms and Autonomy</strong></td>
<td>- Group project -</td>
</tr>
<tr>
<td></td>
<td>Autonomy: Control Architecture, Reactive, Hierarchical, Hybrid, Behavior-based, Feed-back, Cybernetics, Tele-operation</td>
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<td>10</td>
<td><strong>Robot Paradigms and Autonomy Cont…</strong></td>
<td>- Group project -</td>
</tr>
<tr>
<td>11</td>
<td><strong>Robot Control and Dynamics</strong>&lt;br&gt;Robot Control Implementation: Time Scale, Modularity, Representation</td>
<td>- Group project -</td>
</tr>
<tr>
<td>12</td>
<td><strong>Motion Planning and Navigation</strong>&lt;br&gt;Topological Path Planning, Metric Path Planning, Localization and Map Making</td>
<td>- Group project -</td>
</tr>
<tr>
<td>13</td>
<td><strong>Motion Planning Cont…</strong></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td><strong>Introduction to Intelligent Skills</strong>&lt;br&gt;Supervised Learning, Neural Networks, From Demonstration, From Robot Teachers, Genetic Algorithms, Fuzzy Logic, Robot Mind, Computational Thought, Cognitive Modeling</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td><strong>Applications</strong>&lt;br&gt;Embedded Systems, Avionics, Automotive, Rail Transportation, Space, Home Robots, Industrial Robotics, Future of Robots</td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Criteria**

**Practical Assignments**

The students are assigned to 5 groups (This depending on the batch size). Each group is given a simple real-world problem to solve. Students should program a robot to solve the problem. In addition, each student has to design a poster on a specific topic.

**Final Examination**

There are four compulsory questions. The duration of the examination is two hours. The paper is set with

1. theoretical questions directly from lectures,
2. questions from references,
3. questions from practical classes, and
4. questions from real-world applications.


### Allocation of the Marks

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments and Labs</td>
<td>50%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>50%</td>
</tr>
</tbody>
</table>

### References & Textbooks


### Robot Kits & Packages

- LEGO(R) MindStorms Robotics Invention System (RIS)
- LEGO(R) MindStorms RoboSports Expansion Set
- Microprocessor Prototype Board PIC16F84 and PIC16F877
- NQC, BrickOS, MPLab

These descriptions are also included in the course handbook of SCS 4013 (see Appendix B) and communicated to students at the beginning of the course. I have tried to follow the planned schedule; however, I could not cover all the topics as I planned because there were some holidays in the calendar. The next chapter describes my lecturing styles and other details regarding my teaching.

### 5.5. Reflections and Commitments to SEDA

This chapter has discussed my commitments towards designing a course while referring to learning theories, such as, Bloom’s taxonomy and constructive alignment. Although, the focus of this chapter is on one course, I have tried to apply my course designing knowledge on other courses I teach as well. Therefore,

- **contribute** to the process of module/program design, implementation and evaluation (SEDA outcome)
✓ The development both of people and educational processes and systems (SEDA value)

My earlier practice was stating objectives of a course and use words, such as, ‘understand’ when I was designing a course. However, after exposing to learning theories as a result of the CTHE course, I realized that it is totally inappropriate and odd. So, now I am trying to correct that mistake while reflecting usage of theories. Even, in this portfolio, I have started each chapter by stating the learning outcomes. This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

✓ **identify** your own professional development goals, directions or priorities (SEDA outcome)
✓ **plan** for your initial and/or continuing professional development (SEDA outcome)
✓ **undertake** appropriate development activities (SEDA outcome)
✓ **review** your development and your practice, and the relations between them (SEDA outcome)

After designing, learning outcomes, I have tried to align all the learning activities and assessment criteria with them. I am still not happy with the success of this effort, because I feel like these three components are not yet properly aligned. However, as a reflective practitioner, I am confident that I can improve myself with over time. Therefore,

✓ Continued reflection on professional practice (SEDA value)

As a result of integrating theoretical foundation for my course design exercise, I have been able to upgrade the quality of the course. The course has designed while expecting skills at different levels of Blooms and SOLO taxonomies (section 5.2). The learning activities are designed to enable active learning in the classroom as well as to fulfill the learning outcomes (section 5.3 and chapter 6). Therefore,

✓ **inform** your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
✓ **extend** your use of learning, teaching and assessment approaches (SEDA outcome)
✓ An understanding of how people learn (SEDA value)
✓ Scholarship, professionalism and ethical practice (SEDA value)
Another aspect of a course is to support the diversity of students in their different styles of learning. The course has indirectly thought of that factor as well when organizing the topics. I have designed a supplementary note set as well as a detailed laboratory script to support the students (see chapter 6 as well). Therefore,

✓ **provide** support to students on academic/pastoral issues (SEDA outcome)
✓ Working effectively with diversity and promoting inclusively (SEDA value)
Chapter 6. Teaching and Learning

After deliberately reading this section the reader will be able to (but not limiting to),

- Recognize the value of understanding how people learn
- Describe and contrast deep and surface learning
- Recognize students’ performance over passive and active learning and apply lecture breaks to restore students’ attention
- Describe students’ engagement dialogue and its uses to encourage active learning
- Plan a lecture while incorporating learning activities
- Recognize factors for effective teaching and presentation
- Describe how methods, such as, SQ3R and mind-maps help to improve ones teaching and learning
- Recognize interactive computing interfaces that can be used to improve teaching and learning
- Evaluate commitments and achievements of SEDA outcomes and values

6.1. Introductory Remarks

This chapter discusses my commitments to extend teaching and learning. In teaching, I have basically considered students learning through lectures. The learning of students can be deep or surface, and as an effective teacher my prime focus is to make the students engage in deep learning. For achieving this objective, I have introduced lecture breaks in to lectures at first place. However, to make the learning more active, I have consulted Professor L. Dee Fink’s model of active learning as well as integrated tell-show-do activities into lectures. Finally, the chapter shows how I have applied those theories when planning the course SCS 4013 (see chapter 4 and 5 as well).

Finally, the chapter discusses how I have used various techniques to improve my own learning, such as, SQ3R and mind-maps. Then the chapter presents some computing tools and infrastructure that can help us to enhance our learning and teaching.
The final focus of this chapter is to discuss my achievements of SEDA outcomes and commitments to SEDA values.

6.2. Deep and Surface Learning

Gibbs and Habeshaw (1992) describe deep and surface learning as:

“In deep learning students focus their attention on the underlying meaning or message. They attempt to relate ideas together and construct their own meaning, possibly in relation to their own experience, whereas; in surface learning students focus their attention on isolated details. They are often trying to memorize these individual details in the same form in which they appeared.”

If we refer to Newman’s (1854) article on university student, it is clear that the society expects more than memorized details by a university student. Therefore, university students should always try to engage in deep learning. The deep learning can be enabled through active learning in lectures. CVCP module 1 (1992) lists four distinctive features of active learning:

- a search for meaning and understanding
- greater student responsibility for learning
- a concern with skills as well as knowledge
- an approach to the curriculum which looks beyond graduation to wider career and social settings

When designing an active lesson it is important to take an account on at least the following aspects:

- Students’ performance on attention over time
- Level to which the learning happens in the class
6.3. Students’ Attention Over a Lecture and Lecture Breaks

Gibbs and Habeshaw (1992) describe how attention varies against time when people carry out a passive task for a very long period. The evidence shows that learners lose their attention in lecturers quite quickly (see figure 4).

![Figure 4: Learners lose their attention in lectures quite quickly](image)

One way to overcome this psychological barrier is by introducing a lecture break at the end of 15-20 minutes duration of a passive task. As a result, the learners will experience somewhat fluctuating but not declining performance (see figure 5).

![Figure 5: Restoring learners’ performance by lecture breaks](image)

When implementing lecture breaks the teacher can select either one which more productive towards learning outcomes, such as, lecturer asking learners to solve a small problem or discuss a question with a neighbor for two minutes or something more neutral, such as, just relax for a while (Gibbs and Habeshaw, 1992, *Types of Lecture Breaks*, CTHE course notes). More productive lecture breaks come from the idea that the activities which led by lecture
breaks are aligned with learning outcomes of the course (Constructive Alignment, Biggs, 1999).

### 6.4. Active Learning in Lectures

Effective instruction engages students in active learning experiences. The theory behind active learning is that students will arrive at deeper understanding of a subject if they approach it in a variety of ways. Teaching for active learning therefore employs different activities in conjunction, to encourage student interaction so that we may “create dialectic between experience and dialogue” (L. Dee Fink).

L. Dee Fink’s model of active learning (see Figure 6) divides student activity into two categories, “Dialogue with Self” and “Dialogue with Others.” Dialogue with Self is reflection, or thinking about thinking, in which students learn by building on what they already know. Throughout the course of the semester, students can maintain a journal for their observations about what they are learning, how they are learning it, and what the significance of that knowledge and experience is. Instructors can begin sessions by asking students to write in their journals their current ideas about the subject before they move into small group discussions. Discussion, or Dialogue with Others, prompts students to articulate their own ideas and to understand and respond to the ideas of other students. In the attempt to do so, students question each other and incorporate other ideas. Ultimately, they are often prompted to reevaluate their own ideas.

This model of active learning also requires the student to takes on two distinct roles, the Observing Learner and the Doing Learner. The Observing Learner watches or listens to someone else “Doing.” For example, the learner observes another student (or the instructor) presenting an argument. The Observing Learner becomes the Doing Learner by then performing the activity.
It is the combination of the two activities and roles that accomplishes the whole active learning experience. For example, before engaging in a small group discussion, students have the opportunity to reflect on their own thoughts on a given topic (Dialogue with Self.) After they have written down their initial ideas and they can discuss the issues (Dialogue with Others) in a small group discussion much richer than if students had not processed individually. They can follow up the process with another entry in their journals, reflecting on what they have gained from the experience.

(From: Kate Loehman’s article on How People Learn)

6.5. Lecture Planning of SCS 4013

I have used the course SCS 4013 to implement active learning with lecture breaks. The following are some aspects (learning activities as well) I have incorporated into the course:

- **Give incomplete handouts to students**
  I have created a minimal note (supplementary note) for each lesson and distributed the note in the previous week to each lecture. This enabled the opportunity to students to read the note before coming to the lecture. This note covers only the most essential
details of a topic. However, to get a clear idea, students have to attend the lectures and participate to the activities assigned during the lecture. Therefore, students can not just skip the lectures after collecting the note. A sample of SCS 4013 supplementary note is attached in Appendix B

- **Show small video clips in the class**
  I have collected some video clips from the Internet that show how the knowledge has been applied in the field. I have used to show few of these video clips in each lecture during lecture breaks. This would have helped the students to relate what they have learnt in the class with real-world applications

- **Small demonstrations**
  Whenever I have necessary resources, I always tried to demonstrate the steps of applying the knowledge for doing tasks, such as, programming a microcontroller. This is very important when those tasks need not only theoretical knowledge, but also other skills (and tacit knowledge) which usually can not be covered under a passive lecture

- **Ask the students to solve small problems**
  When I see that students are declining with their performance, I give small exercises to them. While they are attending the exercise, I visit them around to see how they are approaching the questions and to guide them with necessary guidance

- **Guest lecturers**
  To break the uniformity of lectures and to cover more knowledge components, I have invited few outside lecturers

After considering the theoretical aspects and my planed activities, I have designed and practiced the following lecture plan for the 1st lecture of SCS 4013 course.

Note: These lesson plans have been practiced after proposing a typical lesson plan under my Learning Agreement Number 03.
<table>
<thead>
<tr>
<th>Stage and Time</th>
<th>Topic</th>
<th>Details</th>
<th>Resources needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 min</td>
<td>Opening and introduction to the course</td>
<td>Discuss learning outcomes and the course philosophy</td>
<td>Course handbook, PowerPoint slides</td>
</tr>
<tr>
<td>20 min</td>
<td>Lecture break -</td>
<td>Give an exercise to students to check their competence in electronics and mechanics</td>
<td>Rough sheets</td>
</tr>
<tr>
<td>30 min</td>
<td>Input</td>
<td>What is a microcontroller? Its uses, families of chips, architectural features…</td>
<td>Supplementary note, PowerPoint slides</td>
</tr>
<tr>
<td>20 min</td>
<td>Lecture break -</td>
<td>A demonstration to show how to program a microcontroller using assembly</td>
<td>Software: MPLAB, MPASM and ICProg, Hardware: Chip-burner device, 9V battery, 5V regulator device and demo board</td>
</tr>
<tr>
<td>20 min</td>
<td>Input</td>
<td>Components of a microcontroller</td>
<td>PowerPoint slides</td>
</tr>
<tr>
<td>10 min</td>
<td>Lecture break -</td>
<td>Instant questionnaire to students</td>
<td>PowerPoint slides</td>
</tr>
</tbody>
</table>

**Figure 7: The lecture plan of the 1st lecture of SCS 4013**

Observations of lecture 1:

- All the students were present for the lecture. This might be because it is the first lecture of the course
- From the faces and their orientation, I concluded that I was able to practice an active lecture in the classroom. This was evident from the instant questionnaire I gave at the end, which included the following questions:
• What is the difference between a microprocessor and a microcontroller?
• A microprocessor is to be used in an application requiring 1 kb of data memory and a program of 8 kb.
  o What type of memory is required in each case?
    ▪ For a prototype system
    ▪ For a final product
  o Also, how many bits would be required for the address bus?

- From the questionnaire which I gave to check the students’ competence in electronics and mechanics, I found that their competence is not satisfactory. Therefore, I have readjusted the other lectures to best support their abilities.

The 2nd and 3rd lectures were done by two invited lecturers. One of them was a senior lecturer who is good in microcontroller programming. The other lecturer was from the industry. He discussed about industry applications and their conducts when concern to microcontrollers. The students were very curious about those knowledge components and raised lots of questions during the lectures. This was a realization of my Learning Agreement Number 07.

However, later in the lecture series I have encountered the following problems:
• Students were getting delayed to come to lectures
• Attendance of students has decreased to around 75%

The lecture of SCS 4013 is from 1 pm to 3 pm and it is the most critical duration of the day where students are very reluctant to have lectures immediately after lunch. To resolve this, I thought I would try to introduce two columns under attendance sheet, where one column is to put the signature if the student comes before 1:15 pm and the second column if the student comes after 1:15 pm (a similar approach has been practiced at CTHE workshops). Soon, the students changed their behaviors to come to the lectures on time (otherwise not come at all). Once again I was able to continue my lectures without much disturbances by the late comers.

I could not see a good solution to the second problem. I found that some of these students are doing part-time jobs (this is rather expected from 4th year students). I thought it is not good to
forcefully request them to come to the lectures or introduce a minimum percentage of attendance. Therefore, I suggested them to attend at least one member from each laboratory practical groups, so that later on they can synchronize their knowledge. This has resolved the problem for the moment.

Another major active learning component of SCS 4013 was laboratory practical sessions. This is discussed under the sections 6.7 and 7.5.

6.6. Improving Presentation Skills

None of the above has achieved without proper planning of lectures and proper communication with students. Simon Tupman says “A good presentation depends on making a good connection with your audience and doing your homework well” in his article “Avoid Presentation Panic”. He further lists some important factors the speaker has to take into his/her account:

• Focus on the audience, not on yourself
• Ask about your audience
• Ask about the event
• Ask about the venue
• Prepare your presentation
• Practice your presentation
• Eat well in advance
• Introduce yourself to members of the audience
• Be ready to make mistakes

This features that the teacher has to consult the 3P model (Biggs, 1999) when planning for a presentation or a lecture. In the previous section, I have discussed about lecture planning for my lectures. While this planning in hand, I have used to rehearse my lecture presentation several times before actual commencement of the lecture. This practice has helped me to identify sections where I would get stuck, maintain a proper order in presenting the facts, and manage the time properly.
In order to develop presentation skills of students I have incorporated presentations led assessment components into the course. Details of these assessment components are discussed in the section 7.4. So far I have not thought of advising students on how to do a good presentation, because I thought I am not in a position to advise someone else before improving myself. However, now I am little bit confident enough about myself and hoping to help students in the future.

### 6.7. Small Group Teaching

Professor L. Dee Fink’s model of active learning suggests that active learning involves both “Dialogue with Self” and “Dialogue with Others” (see section 6.4 above).

Much of the time students must work alone. Students usually accept this sitting in lectures, reading in the library or working in the laboratory involves concentrated individual effort. But there is much to be gained from working collaboratively with others, both in terms of the richness in ideas which come from hearing and discussing a variety of points of view, and in terms of the personal and interpersonal benefits that derive from co-operative activity. Furthermore, discussing points of interest and controversy enables the contributors to develop deep approaches to the processing of information. This is especially important if you aim to develop your students’ ability to work creatively with ideas, to develop their ability to think things through, and to develop their communication skills, for example, to present a point of view logically and directly or to build on the ideas of others. (Gibbs and Habeshaw, 1992)

Students’ dialog can be best developed using snowball learning (CTHE course notes). According to snowball, students first start to work individually. Then they proceed to work in pairs or groups. Finally, they all gather for a plenary session. Gibbs and Habeshaw (1992) discuss a similar method of learning, which is called a Pyramid. There, the teacher gives students a task to work on alone, and then put them in pairs to discuss what they have done, in fours to draw conclusions. Finally, hold a full group discussion to compare the conclusions which have been produced. This invariably increases the involvement of low contributors.
Gibbs and Habeshaw (1992) suggest some other possibilities for collaborative learning:

- **Buzz groups**
  Set a brief task or question for pairs to work on before moving on, for example, what conclusions have you drawn so far? It is almost impossible for students to stay quiet and it almost always generates new content and energy

- **Syndicate groups**
  In large groups, set up groups of 4-6 to work in parallel on the same problem, task or question. Circulate round the groups. Then convene a whole group plenary to which the syndicate groups report. This method can be useful for coping with excessively large seminar groups

- **Leave the room**
  After setting the seminar up and briefing your students, simply leave the room for a while. Students usually enjoy the opportunity of uninterrupted discussion and involve more. Use the last two minutes of the seminar to discuss their experiences and ask if they want to repeat it

- **Rounds**
  This involves everyone in the group, going round the circle in turn, saying something on a particular theme

We as students experienced a similar collaborative learning environment in CTHE workshops and it gave the birth to my idea to practice some techniques in my lectures (reflected in my Learning Agreement Number 08). Earlier I had difficulties in enabling collaborative learning in class, because I did not have justification on how it contributes to students’ learning and did not know the techniques of structuring such collaboration. I have planned to practice small group teaching in lectures in coming semester and this semester I could not practice, because I did not have a large class of students.

I have implemented somewhat differed collaborative learning environment for laboratory practicals and group project of SCS 4013 course. The only drawback is I can not see how they are performing as groups, because the groups are functioning outside the lecture hours. However, in laboratory practical sessions I have seen that they are working under a group spirit and therefore they are engaging in active learning.
6.8. My Own Learning

I can remember my father was always telling me ‘your education is to learn how to learn things.’ I do not know from where he had extracted this, but I realized that the school education is to prepare students to learn the things in the future.

During my university education, I found that lot of concepts which I have learned in my school age are either wrong or incomplete. So, I had to forget them and relearn them again. I regretted very much because of the decisions I had taken based on these kinds of inappropriate knowledge components. However, later I realized that there is no such a ‘complete’, ‘perfect’ or an ‘absolute’ knowledge in the world. Everything changes over time. The science is changing very rapidly. Sometime back all believed that all space objects are revolving around the earth, but later it has changed after the discoveries by Nicolaus Copernicus (1473-1543) and Johannes Kepler (1571-1630).

The second aspect of learning is how we absorb and organize knowledge in ourselves and then how we use them in our day-to-day activities. Biggs (1999) (Course Handbook, CTHE) presents this structure organizing the components in a hierarchy, as given in figure 8,

![Diagram of Kinds of knowledge and interrelationships](image)

Figure 8: Kinds of knowledge and interrelationships
For instance, for a teacher,

If you have the ‘declarative knowledge’ (on what possible methods are available)

AND

Know the ‘procedures’ (as to how) to apply/use them,

AND

You are aware under which ‘conditions/needs’ (or when) they can be appropriately

applied/used,

THAT

Your knowledge can become truly ‘functional’ in a useful way

A rather sophisticated model can be located from cognitive science. Figure 9 gives the model
which has been proposed by the cognitive architecture, named ACT-R (Anderson and
Labiere, 1998)

Figure 9: ACT-R human cognitive architecture
Researchers in the field of cognitive modeling uses the above model to explain how humans learn declarative knowledge (as chunks) and procedural knowledge (as productions) and then make decisions. Further, it explains how emotions and other sub-symbolic information affect our decisions. The model can be even extended to understand consciousness as well.

Now, I know what is learning. My task is to make me (and others) effective in learning. From my exposure to CTHE workshops, I have identified two techniques which can help me:

- The SQ3R and PQRST methods of studying
- Mind maps to organize knowledge

The SQ3R (Robinson, 1970) (CTHE course notes) is a method for active elaboration of material that you read, say in a test book. It consists of 5 steps (here it is talk in terms of chapter from the text):

- Survey (1 minute): see what the headings are without reading the content…
- Question (usually less than 30 seconds): Ask yourself what this chapter is about…
- Read (slower for some of us than others!): Read one section at a time looking for the answer to the question proposed by the heading…
- Recite/write (about a minute): Say to yourself or write down a key phase that sums up the major point of the section and answers the question…
- Review (less than 5 minutes): Test yourself by covering up the key phases and seeing if you can recall them…

PQRST stands for:

- PREVIEW
- QUESTION
- READ
- SELF-RECITATION
- TEST

and, it helps to improve the SQ3R method of studying.

A mind map (e.g. figure 10) is a diagram used to represent words, ideas, tasks or other items linked to and arranged radially around a central key word or idea. It is used to generate,
visualize, structure and classify ideas, and as an aid in study, organization, problem solving, and decision making (Wikipedia).

Figure 10: A mind-map

The above methods have helped me to improve my studying. In my seminar presentation, which I have delivered for CTHE, I have mentioned about how I have used mind maps including computing tools (see the section 6.9).

6.9. Inspiring Computing Technologies into Teaching and Learning

We have now stepped into information era, where computing infrastructure has spread all over the world facilitating information and communication technology. As a result, the conventional teacher-centered learning is gradually changing into student-centered learning. Now, there are many other knowledge sources a student can consult in addition to a classroom. The purpose of this section is to list some of those technologies I have identified to improve my teaching and learning activities.
6.9.1. Word Processors

We use word processors to create letters, reports, etc. Word processors help us in these efforts by allowing us to improve the use of language (through spelling and grammar checkers), formatting of the document (fonts and font sizes, colors, etc.), sharing the documents with others, printing, etc. It greatly eliminate the need of papers, thus minimizes the wastage (environment friendly).

6.9.2. Internet and Email

Internet connects almost all networks in the world and allows everyone to share their information. As a result, we can update ourselves with latest information. This is a very useful source for researchers, because they can find out what is latest with respect to research. Students also get benefited from Internet, because they can access tutorials, books, etc. However, there are bad sides of this as well; some students misuse this facility to copy someone else’s work and present them as their own work. Still, there are solutions to this issue.

Email helps us to exchanges our messages over the Internet. It is fast and cheap. It also eliminates the need of papers involved in conventional snail mail system. It is the first choice in our institute to communicate with other staff members and groups. Even students use this facility to communicate their problems with their teachers and to submit soft-copies of their reports.

6.9.3. Learning Management Systems

Our institute had set up a learning management system (LMS) for our undergraduates. It is a system where teachers, students and all other stakeholders gather to effectively learn and communicate learning related matters. It provides accountability, so we can find out the students who are actually working with the LMS and what they were doing. The following figure 11 shows the main page of the course SCS 4013, where I have uploaded all the lecture notes and some other resources which will help the students to improve their learning.
There are many other facilities which a LMS enables for teachers and students. We can set up discussion forums, online quizzes, online submissions, etc. However, in my case I have not looked at these other facilities yet. But I know that if I do, I can really influence the students well.

6.9.4. Mind-mapping Tools

I have discussed about mind mapping in the section 6.8. Here I concentrate on computing tools that can facilitate our mind-mapping efforts. The tool which is on my focus is FreeMind, which is free and open-source software. A mind-map created using this tool is represented in the figure 12.
I have included a discussion about mind-mapping and computing tools for my CTHE seminar presentation as well. I am using mind-mapping for several activities, including:

- Elaborate my thoughts and ideas
- My learning
- When discussing the points with others, etc.

6.9.5. Interactive Learning Environments

The technologies I have discussed so far are now under use by lot of us. However, there are some technologies only few of us know when I was writing this chapter. One such technology is explanograms.

Explanograms are explanatory text and diagrams captured and stored as they are developed over time and it offer an ancient means of communication by preserving chronology of
creation of written material. What you need are a special pen and a paper (figure 13). Then, you can write (or draw) things on the paper as you usually do. But, the important observation is each and every pen stroke is eventually getting recorded in a computer. So, later on, you can give that recording to someone else, so that he/she can see how you have developed it or explained. You can even create an explanogram describing some concept (e.g. mathematical equation) and give it to many students. This also can be used in other way also, i.e. you can ask each student to make explanogram as they answer to a written examination. Finally, you can examine them to see how they are answering questions. This also helps to locate cheatings as no two students can answer a question in a same way.

A complete description of explanograms can be found by visiting http://explanogram.it.uu.se/

![Figure 13: A pen and a sheet needed to create an explanogram](image)

The next technology is an advancement of whiteboards we see in a modern classroom, which is called ‘interactive whiteboard’. This new whiteboard is touch-sensitive and thus it can record anything written on the board. With a suitable computing platform and a front (or rear) projection, one can make it more interactive.

This interactive whiteboard solution can enhance the teaching of a typical classroom by bringing multimedia and animation to the classroom.
6.10. Reflections and Commitments to SEDA

This chapter has described my commitments towards extending learning and assessment approaches while learning how people learn, i.e.

- **extend** your use of learning, teaching and assessment approaches (SEDA outcome)
- **contribute** to the process of module/program design, implementation and evaluation (SEDA outcome)
- The development both of people and educational processes and systems (SEDA value)
- An understanding of how people learn (SEDA value)

The constructive alignment suggests that we need to properly align the curriculum, the teaching methods (learning activities) as well as assessment procedures to encourage deep engagement in learning of students (sections 6.1 and 6.2). The previous chapter described the designing of learning outcomes for the course SCS 4013. This chapter extended this discussion on SCS 4013 course while describing how those learning activities are used to encourage active learning (sections 6.4 and 6.5). There it describes how my reflective
practice of learning my mistakes. In addition, this chapter discussed my intentions to enable small group discussions (section 6.7). Later, the chapter addressed my own learning and the techniques I have incorporated to improve my learning (section 6.8). Finally, it presented some computing technologies that have some potential to enhance our teaching and learning activities (section 6.9). This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

- **identify** your own professional development goals, directions or priorities (SEDA outcome)
- **plan** for your initial and/or continuing professional development (SEDA outcome)
- **undertake** appropriate development activities (SEDA outcome)
- **review** your development and your practice, and the relations between them (SEDA outcome)
- **Continued reflection on professional practice** (SEDA value)

Throughout the chapter, I have evaluated my existing attitudes towards teaching and learning with respect to effective teaching methodologies, such as, active learning, and I have incorporated them in effective ways. Therefore,

- **use** a variety of methods for evaluating your teaching role (SEDA outcome)
- **inform** your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
- **Scholarship, professionalism and ethical practice** (SEDA value)

The teaching and learning theories have helped me to see how I can help each and every student’s learning without excluding them (section 6.5)

- **provide** support to students on academic/pastoral issues (SEDA outcome)
- Working effectively with diversity and promoting inclusively (SEDA value)

Moreover, I could enter into the learning community who practices effective learning methods to enhance their learning and extend its benefits to others, for instance, as a CTHE practitioner I am very keen to share my successful techniques with others. Therefore,

- **Working in and developing learning communities** (SEDA value)
Chapter 7. Assessing Students

After deliberately reading this section the reader will be able to (but not limiting to),

- Recognize the value of understanding how people learn
- Describe constructive alignment in terms of learning outcomes, learning activities and assessment
- Identify and explain why assessment is important for student learning
- Identify theories and apply them to design a good assessment procedure
- Recognize how assessment can be used as a tool to encourage deep learning
- Plan an assessment methodology for a course
- Evaluate commitments and achievements of SEDA outcomes and values

7.1. Introductory Remarks

Learning is not the only component which decides a good course. Constructive alignment (Biggs, 1999) suggests that we need to properly align the curriculum, the teaching methods (activities) as well as assessment procedures to encourage deep engagement in learning. The focus of this chapter is to introduce assessment as a tool to direct student’s learning. The chapter also discusses different types of assessment, such as, formative and summative. Thereafter, the chapter extends its discussion while presenting how I have planned assessment methodologies for the courses SCS 4013 and ICT 2012.

This is the first time in my academic life where I have tried to influence the assessment procedure of some courses. First, I proposed my planned changes under my learning agreements. After receiving feedback, I have tried to implement some of them. When implementing, I had to face several unexpected issues and I had to adjust my assessment methods accordingly. Anyway, as a reflective practitioner, I could do the right thing by maintaining my academic integrity.

The final focus of this chapter is to discuss my achievements of SEDA outcomes and commitments to SEDA values.
7.2. Why assessment is important?

“Students can escape bad teaching; they can’t avoid bad assessment”

“Assessment methods and requirements probably have a greater influence on how and what students learn than any other single factor. This influence may well be of greater importance than the impact of teaching materials”

David Boud (1994 and 1995) (CTHE course notes)

Gibbs and Habeshaw (1992) suggest using assessment to direct students’ attention to what matters. Most students are heavily influenced by the assessment system. They study those topics and practice those skills which they think are most likely to be assessed. Therefore, if we do not use the assessment system deliberately to orient students to what matters for us then we are throwing away the most powerful tool that we have for influencing student learning.

We should use this tool very carefully. When we are planning to assess students, we need to be really clear about what the particular reason or reasons on this occasion are so we can design assessment instruments accordingly. We need to be able to justify, to students, our colleagues, moderators, external/professional bodies and ourselves why we have made these choices. (SEDA Special No. 3)

There are a large number of purposes for which we might wish to access our students (SEDA Special No. 3):

- Provide feedback to students so they can learn form mistakes and build on achievements
- Classify or grade student achievement
- Enable students to correct errors and remedy deficiencies
- Motivate students and focus their sense of achievement
- Consolidate student learning
- Help students to apply abstract principles to practical contexts
- Estimate students’ potential to progress to other levels or courses
- Guide selection or option choice
• Give us feedback on how effective we are being at promoting learning
• Provide statistics for internal and external agencies
• Indicate standards and provide performance indicators

Some further questions we may find answers include:

• How well do our choices fit in with learning outcomes?
• Who benefits from the assessment process on this occasion?
• Are our purposes compatible with other aspects of the learning programme?
• Do our choices fit in with local department/school/route requirements as well as those of the university?

7.3. Types of Assessment

Assessment refers to the processes and procedures used to measure or otherwise evaluate student achievement of the learning objectives/outcomes of a unit or program of study.

Continuous assessment refers to assessment tasks undertaken during the teaching semester, while final assessment refers to an assessment task or tasks undertaken following the conclusion of the teaching semester.

Formative assessment refers to tasks that are part of the developmental or ongoing teaching/learning process. It should provide ongoing feedback to the student.

Summative assessment refers to tasks that often occur at the end of a unit and is used primarily to provide information about how much the student has learned.

Norm-referenced assessment compares students against the performance of other students in a task.

Criterion-referenced assessment is based on explicit criteria for the task.

(from Lublin, 2000)
7.4. Designing Assessment Methodology for SCS 4013

Biggs (1999) suggests that one of the keys to successful learning is an aligned curriculum: this means that learning outcomes are clear, learning experiences are designed to assist student achievement of those outcomes, and carefully designed assessment tasks allow students to demonstrate achievement of those outcomes to some level of sophistication or depth in Blooms and SOLO taxonomies (CTHE course notes).

I practiced designing a good assessment methodology for the course module SCS 4013 by referring to above theories. The proposed methodology can be found in Learning Agreement Number 02. When designing the methodology, I have considered the following:

- What are the current agreed assessment methods in our institute?
- What are my purposes?
- How well the existing assessment methods fit in with those objectives?
- What issues can be anticipated?

I noticed that most course modules that have practical component have the following assessment methodology:

- In-class assignment
  This is a 1-2 hour(s) structured and/or MCQ paper, without access to books or resources
- Group project
  Students are formed into groups and given a project. The project is to develop a software system. Their performance is measured through a series of reports, presentations and demonstrations
- Year-end examination
  This is again a 2-3 hours structured and/or MCQ paper, without access to books or resources

In addition, the weight of marks is distributed as:

- Year-end examination: 70%
• Other assessment components: 30% (normally 15% each for in-class assignment and group project)

As the second step, I recalled my purposes. I wanted to use the assessment as a tool to take the students into deep active learning curve which I cannot achieve in lectures. One drawback I saw in existing assessment methods is that most of them are “boring” to students. For example, the in-class assignment is again a written exercise without access to books.

Gibbs and Habeshaw (1992) suggest:

“Conventional three-hour written exams, without access to books or other resources, are a very poor way of assessing students. They require a type of performance which is unlike anything else they will have to do in our life. They put a premium on memory, conformity, competition and speed. They have low reliability and very poor ability to predict subsequent performance at anything outside very similarly assessed academic courses”

Therefore, my plan was to minimize conventional written type of assessment. Fortunately, the chain of boards for undergraduate studies had allowed this course to reduce the weight of year-end written exam to 50% after considering the practical nature of the course.

Again, I wanted to reduce the burden to students which has put by assessment. For instance, long report writing for mini-projects take them away from actual deep learning, where report writing is another aspect of learning which can be addressed separately. There I wanted to introduce an alternative method as an evidence to verify that the student has actually contributed to the effort.

Another aspect I considered when designing the assessment methodology was that it should help me to see the success of my teaching with respect to the extent the students have engaged in their learning. If I am successful in my effort, I can retain and improve the mutual trust between me and the institute.

While I was estimating the above ends, one day I got the idea about the poster presentation as a result of a group work activity I engaged in one of the CTHE workshops. Later, I found a link from literature references as well, which is called crit assessment (Gibbs and Habeshaw,
Finally, as the first attempt I proposed the following assessment methodology for SCS 4013 and this gave the birth to my Learning Agreement Number 02.

- Individual poster presentation: 25% of marks
- Group project: 25% of marks
- Year-end examination: 50% of marks

The above procedure was proposed before the commencement of lectures for the course. However, later I realized that if I do not put some weight for laboratory practical sessions I will not be able to motivate the students to participate for practicals (using the assessment as a tool). Therefore, I revised the methodology as follows:

- Laboratory practical sessions: 15% of marks
- Individual poster presentation: 15% of marks
- Group project: 20% of marks
- Year-end examination: 50% of marks

The following sections focus on these components and will give details about how these methods have contributed to students’ learning and for other requirements I have mentioned above.

7.5. Assessing Laboratory Practicals of SCS 4013

Affording for laboratory practicals is very expensive in terms of my effort and resources. Since this is the first time the course is appearing in the curriculum, none of us (me or supporting staff members) had previous experience about laboratories of this nature. However, as a result of exploring what other overseas universities are doing, I could find some cues of designing laboratories for our students. Next, I had to tackle with the problem of having very limited number of resources. I approached this problem in two ways: support I can get from the institute and how I can contribute from my own equipments. From the side of institute, it supported to purchase some LEGO Mindstorms kits and some equipment to the laboratory. Since I have skills on electronics, I could make some equipments after purchasing row parts from local vendors for cheap costs, otherwise they become very expensive to purchase from outside.
For supporting the purpose of conducting laboratory practical sessions, I found the following reasons from literature (Gibbs and Habeshaw, 1992):

- To develop skills with equipment
- To demonstrate phenomena
- To develop scientific methodology
- To aid the grasp of new concepts
- To improve report writing
- To increase accuracy in measurement
- To practice mathematical methods

I found that it is a good if I can prepare a laboratory script (Gibbs and Habeshaw, 1992) for each practical. However, in that I used a technique, such that, for the first couple of laboratory scripts I would include all the necessary theories and steps required for conducting a practical; but later I would give only the most essential details and references, so that I could direct the students to tryout reading some background before doing a practical. Samples of both forms of practical sheets are attached in the Appendix B.

For doing practicals, I formed the students in to groups (four groups, each of size two). Each group was given a three hours laboratory work slot for each practical and they have to finish the practical within one week from the assigned date (some flexibility under unavoidable circumstances). As they leave the lab, they had to handover two reports: instant lab report and advisory report (Gibbs and Habeshaw, 1992):

- Instant lab report
  This is a one page individual report each member of the group has to produce as they leave the lab. The purpose of this report is to allow each student to think back and link theories to practice, and to reflect their experience with conclusions
- Advisory report
  This is a one page group report the students have to produce formulating advice to the next group of students (in the next batch) who would undertake the same lab

However, while I am practicing the above scheme I realized that I had not communicated the marking criteria of those reports to students. Also, the students were unaware of what exactly
should be included into those reports. To resolve this situation I have revised the scheme as follows (adopted from Gibbs and Habeshaw, 1992):

- **Instant lab report (individual)**
  The format of this report is attached to the Learning Agreement Number 13. This is accompanied with a laboratory report marking sheet. This sheet contains guidelines and maximum marks allocated for each section of the report. The form has to be returned by the student along with the completed report, and I will be using the marking sheet both to allocate marks and to give feedback to students by writing comments under different headings

- **Advisory report (group)**
  The format of this report is attached to the Learning Agreement Number 13. This form has to be produced by formulating advice to the next group of students who will undertake the lab. Guidelines have been discussed in the class

This revised scheme has been discussed under my Learning Agreement Number 13.

### 7.6. Assessment by Poster Presentation of SCS 4013

Many conferences nowadays have poster sessions. Therefore, I thought that it would be beneficial to students in long term if I could give an exposure of a poster session. At some of CTHE workshops we did several activities which lead us to create a poster. Gibbs and Habeshaw (1992) discuss this under crit assessment. The following learning outcomes are to be measured from this assessment component:

- **describe** the internal architecture of a microcontroller in terms of functional modules,
- **describe** the engineering design of a robot,
- **apply** a broad range of concepts in the field of AI to program a robot,
- **identify** the underlying techniques behind real-word embedded and robotics systems design

Topics for the poster (sheet is attached in the Appendix B) have been distributed among the students using a raffle to make the opportunities fair (a similar procedure has been practiced in CTHE course when assigning timeslots for seminar presentation). They were given 8 weeks for conducting a study on the assigned topic. At the end, each of them had to come up
with a poster using a bristle board summarizing and visualizing the study and present it to an unknown audience comprised of academic staff and other interested participants. During the presentation the students are required to answer questions arising from the participants.

For the evaluation, the following components are considered:

- Marks given by examiners during the presentation: counts 60%
- Report
  - Introduction to the poster topic (1 page) and 10 (at least) frequently asked questions (relevant to the poster topic) asked by the academic staff, while the student is presenting the poster, including the answers (5 pages): counts 40%

Additional benefits to students include developing their presentation skills, creativity, critical thinking, managing time and resources, etc. This simulates poster session of a scientific conference and trains the students on how to prepare and present a poster. The poster evaluation sheet is also attached in the Appendix B.

Unexpectedly, some students came to meet me one day before the presentation and asked me whether it is necessary to print the poster. I asked why and they replied me saying that they have created posters using computer and the printing cost for bristle board size poster is around Rs. 800/=. So, if the examiners point out some mistake in the poster, there is no way to correct it. I got confused. I did not expect a computer generated poster at all and I wanted only a drawing by students. Anyway, I asked them to present their poster using a multimedia projector. The following (figure 15) are some of those posters presented on that day:
The multimedia projector could not project the posters very clearly and the poster session did not succeed as I had expected. Anyway, students had worked hard to create really nice posters. I have reflected that in the next time I should communicate things clearly.

### 7.7. Assessment by Group Project of SCS 4013

Under this assessment component, students are required to implement a robot system as a group for a given challenge. The idea originated while I was reading about some robotics competitions. There are number of robotics competitions organized each year around the world. Even though there themes are different, all most all of them measures the ability to accomplish a simple goal as a team while tackling with design issues. I thought by making the environment challenging and competitive, I will be able to motivate the students for a better active learning curve.

For evaluation the following components are considered:

- Points earned at the contest
  
  This includes additional bonus marks obtained by winning the contest: counts 30%

- Report
Description about the project (1 page) and 10 (at least) frequently asked questions (relevant to the project topic, page limit is 5) asked by the academic staff, while the project is demonstrating. This should include the student’s answers as well: counts 30%

- Marks given by the examiners: counts 40%

Details of this assessment component has been communicated to students and also mentioned in the course handbook (see Appendix B). The assignment sheet is attached in Appendix B.

The following learning outcomes are expected to be satisfied at higher levels of Blooms taxonomy by this assessment component:

- **program** a microcontroller unit to do simple tasks,
- **design** LEGO robots with various mechanical, electronic and sensor controls,
- **apply** a broad range of concepts in the field of AI to program a robot,

From the laboratory practical sessions the students have obtained enough skills to link theoretical knowledge with practice. This group project aims to take them little further in scale and unpredictivity than those laboratory practicals. In addition, the following outcomes were also in mind:

- Interpersonal skills and working under a frame of a team (negotiating, appreciating…)
- Learning from others
- Judging their own work

This competition has held on a recent date and it was really an enjoyable activity for students as well as examiners. However, the rules that I have set were not enough to cover all the issues, and thus we had to dynamically set them as needed. I am confident enough that next time I can make it more perfect.

### 7.8. Assessment by Group Project of ICT 2012

Bachelor of Information and Communication Technology (BICT) is a new degree program started at UCSC in the year 2005. The main role of a student who has been produced by this degree program is to bridge the gap between a business person (a client in software
engineering terms) and a software engineer. The profession of this nature is referred to as a software architect.

Currently, two batches of this degree program are progressing with their studies. The first year of BICT offers a subject module called System Analysis and Design covering most theoretical aspects of that area. This specified area is the most essential ingredient for a system architect. After covering the theories, the students receive practice during their 2nd year. This is achieved through two related modules having the module codes ICT 2002 and ICT 2012 under the theme System Analysis and Design (SAD) Group Project. The focus of ICT 2002 is to give a practice to students on requirements gathering, analysis and design of a software system during their first semester. In the next semester, they continue their work implementing the proposed software system under the module code ICT 2012.

I have been appointed as the main coordinator of these two modules from the beginning. In addition, there are two other coordinators for supporting and examining students’ work. For ICT 2002, we assigned students into groups and allocated projects. When allocating students into groups, we first ordered them by the results they obtained for the systems analysis and design course they had for their 1st year and put them into groups in a way that each group gets good students, average students and weak students. This method has eliminated clustering of students on their choices. We observed the successfulness of this method from the performance of the groups. At least one or two students in each group contributed to function without failing.

Each SAD project originated as a requirement for a software system at some division within the UCSC. In addition, for each project there is a client, who is a person within that division bearing the responsibility of communicating the requirements to students. Most of the time this person is not technically eminent simulating a real-world scenario.

The assessment is governed only by commitment towards successfully doing the project. There is no compulsory course work or year-end examinations. Therefore, we had to design an assessment methodology so that we can influence on how and what students learn than any other single factor (David Boud, 1995) (CTHE course notes). The proposed methodology is as follows:
• Interim project demonstration
• Log forms for project progression
• Final project demonstration
• Final project report (draft and final)

All the demonstrations are done in front of a gathering of academic staff, clients and coordinators. Therefore, the projects are evaluated by a mixed audience. The purpose of the interim project demonstration is to estimate the current progress of student projects and to guide them with feedback (formative assessment). However, the final project demonstration is to evaluate the final outcome of the project and no further modifications are permitted (summative assessment).

Necessary guidelines for producing the final project report have been provided to students in advance (attached in the Appendix B). We allowed submission of a draft project report 2 weeks before the final submission. The idea was to give some feedback about missing components and suggestions to improve their report. The criterion is attached in the Appendix B. Initially, we did not include log forms as an assessment component. However, later we decided to add that because we saw students do not focus constantly on doing the project. Now each group has to submit a log form for every two weeks signed by the client. In addition, clients can include comments reflecting their satisfaction about the current progress. The format of this log form is attached in the Appendix B.

Since clients do not bear technical knowledge we thought it would be inappropriate to give the responsibility of marking project reports to clients. But still the client is the only person who knows how successful the project is to satisfy their needs. This issue has been addressed under the Learning Agreement Number 15. The idea was to use a second marker’s sheet (Gibbs and Habeshaw, 1992). This way it is expected that the information about the extent of the students’ contribution to the finished product has been effectively communicated between examiners.

During the period we received several complains from students about unequal contribution by other members of the group. Finally we decided to do a peer evaluation (this method was adopted from Gardner, 2003). We asked each student to distribute some 100 points among
their groups members based on their contribution. We separated them and did not allow the students to discuss when filling the evaluation form. Even though we thought that they will give equal points to other members, it did not happen for most groups. Therefore, we ended up with a good evaluation.

7.9. Assessment by Year-end Examination of SCS 4013

As I have mentioned in a previous section, year-end written examination of SCS 4013 counts 50% of total marks allocated for that course. Since this is the first time this course is taught in the institute, there are no pass papers available to students to refer or me (setter) to get some idea. However, I found that it is not difficult to setup questions because I have already stated the learning outcomes of the course and already communicated the learning outcomes and assessment method to students. In addition, this information is mentioned in the students’ handbook (see Appendix B).

My Learning Agreement No. 14 discusses how I have been practicing setting good exam questions while applying the theories in the literature. The structure of a question and good practices for answering questions has been communicated to students with the idea that it will help them to improve their skills in answering questions. The same structure has been followed when setting questions for the final written examination of SCS 4013 (I could not attach the paper here, because at the time when I was writing this section, the examination was not held).

7.10. Reflections and Commitments to SEDA

This chapter has described my commitments towards extending assessment approaches and how it can be used to direct students for learning, i.e.

✓ extend your use of learning, teaching and assessment approaches (SEDA outcome)
✓ contribute to the process of module/program design, implementation and evaluation (SEDA outcome)
✓ An understanding of how people learn (SEDA value)
✓ The development both of people and educational processes and systems (SEDA value)
First, it discussed why assessment is important for student’s learning and different forms of assessment (sections 7.1 through 7.3). Thereafter, it discussed how I have consulted my knowledge on assessment to design assessment methodologies for some courses (sections 7.4 through 7.9). This approach was not straightforward. When I was proposing some assessment criteria under my learning agreements, I have proposed them in which I thought appropriate at that time. However, while I was engaging in teaching, I realized that I can not direct students into some learning activities, such as, laboratory practicals (section 7.5), if I do not integrate them into the course assessment criteria. Therefore, later I have changed my assessment procedures to reflect these new amendments. This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

- **identify** your own professional development goals, directions or priorities (SEDA outcome)
- **plan** for your initial and/or continuing professional development (SEDA outcome)
- **undertake** appropriate development activities (SEDA outcome)
- **review** your development and your practice, and the relations between them (SEDA outcome)
- Continued reflection on professional practice (SEDA value)

I have used assessment not only to direct students to learning, but as a way to check my own performance in teaching, i.e.

- **use** a variety of methods for evaluating your teaching role (SEDA outcome)

Even though the assessment criteria have been proposed before the commencement of the lectures, I have tuned it while I was conducting the lectures. When implementing, I have considered the issues the students might be facing, for an instance, as I have discussed in section 7.6 I had to change the criteria at the last moment, because otherwise students had to pay a large amount of money to print the posters. Therefore,

- **provide** support to students on academic/pastoral issues (SEDA outcome)

The assessment is considered as a very much sensitive subject in academic duties. I have never tried to break this agreement during my academic life. I have practiced improving assessment criteria for some course modules after referring to literature and after discussing with senior academics. Therefore,
✓ inform your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
✓ Scholarship, professionalism and ethical practice (SEDA value)

Some assessment methods, such as, poster presentations (section 7.6) and group project competition (section 7.7), are not familiar among my staff members. Therefore, I have invited them to take part in the evaluation panels to let them evaluate those methods by their own. Therefore,
✓ Working in and developing learning communities (SEDA value)

Even though the prime focus of this chapter is to discuss my assessment approaches, I have considered lot of other things as well in order to make it more perfect, such as, issues of students, spreading the message among other staff members, etc. Therefore,
✓ Working effectively with diversity and promoting inclusively (SEDA value)
Chapter 8. Reviewing Teaching

After deliberately reading this section the reader will be able to (but not limiting to),
- Describe why reviewing of one’s teaching and coordination is important
- Recognize the author’s reflections about the past and development as a teacher
- Describe self, student and peer feedback, there techniques and how they can be used to improve one’s teaching and coordination role
- Evaluate commitments and achievements of SEDA outcomes and values

8.1. Introductory Remarks

“When a teacher tells us that a method they use works well, we ask How do you know? Most teachers make most of their decisions about how to teach, about what to teach and about what to change and what to leave alone, without much in the way of solid evidence to guide them. In their discipline, be it Physics or History, they would never draw conclusions without evidence. It should be the same in teaching. Do not just rely on hunches. Get hold of some convincing evidence” (Gibbs and Habeshaw, 1992).

The chapter discusses my efforts to improve my teaching and coordination roles while presenting solid evidence. Although, I have addressed presentation skills in the previous chapter, I have not discussed my reflective practice of it. Therefore, this chapter presents my reflections of presentation skills at the beginning. These presentation skills are an important ingredient when improving the teaching skills.

This chapter then discusses three types of feedback methods, i.e. self, student and peer feedback, I have used to review my teaching and coordination roles of courses. After reviewing my roles, I have taken necessary actions to develop myself. My discussions are not limiting to what matters only for me, because I am presenting a review for CTHE course with the hope that it can be improved more.
Finally, there is a discussion to reflect my achievements of SEDA outcomes and commitments to SEDA values.

8.2. Past Reflections of My Presentation Skills

I did not have a popular character during my school ages. There were reasons for this behavior and this has been discussed under the chapter 2. I could not get rid from my lack of self-confidence until the 2nd year of my university, where I realized that I have to change my attitudes about the life. I wanted to improve my communication skills, presentation skills and inter-personal skills (soft skills). During the same period, I got to know that the Career & Personality Development Centre of University of Colombo conducting a Toastmaster’s program. First, I thought I will not be able to get selected because they are taking only 20 (as I remember) for a year from all the years. As I had anticipated, I did not get selected at the first place, but I was in the eligible list. However, I got to know that two selected students had left the course. Soon, I and one of my friends went to see the organizers and expressed our intentions. Fortunately, the organizers decided to select us to give a chance to follow the course.

I was exposed to a very tuff and challenging learning environment. Each session started with a round-robin session and each participant had to pickup the last word from the previous person’s speech to continue a speech for some period of time until the bell rings. I could not say anything during my turn. In addition, we have to deliver few speeches. The first speech has been named ‘ice-break’. The ice-break speech was very horrible activity for me because I had never done a speech in front of an audience. I wanted to leave the course. But, I planed to leave the course after doing the speech. I was not confident enough to do the speech without writing it down on a paper. The day arrived to do my speech. I walked to the front. I looked at the audience. My whole body was shaking. I consciously attempted to break my ice. Suddenly, the uneasiness went away by giving my mouth some words. Eventually, I had done a good speech than I expected. The panel reported me that I am good in “ar” count and in pauses. I received constructive feedback from the audience to improve my presentation skills, such as, use of eye contacts, sitting and using hands, etc. At the end I have changed my decision of leaving the course.
After few workshops, I did an instant voluntary speech. However, I could not do it effectively as I did my ice-break speech. Again I lost my confidence and left the course without completing it. But, still I can not forget the experience I received from that programme. I was able to do several presentations for my undergraduate assessments using the skills I gained from the Toastmaster’s program.

During the 4th year of my undergraduate studies I was able to participate to another training program under Career & Personality Development programme organized by the Faculty of Science, University of Colombo (see Appendix B). The focus of this program was to train us on facing interviews and doing presentations. This program also helped me to sharpen my presentation skills and facing interviews. As a result, I was able to face several industry led interviews without much difficulty and even got selected to few of them (however, later I changed my mind to remain in the academic and this has been discussed under chapter 2). I think I have missed the opportunity to get to the academic as a probationary lecturer if I had not developed those skills at the right time.

I faced the same difficulty of doing my first lecture as I had with ice-break speech. However, I did not fail it because I knew how to do a presentation at threshold level from the knowledge I gained in the past. Therefore, what lacking was to improve my “teaching for learning” skills. The other sections in this chapter are discussing the steps which I took in order to improve my teaching skills.

During my academic life I have participated to lot of other workshops held at UCSC before the CTHE. In one such workshop, the tutor did a video recording of our presentations and replayed it while commenting on it on what we might do to improve our presentations. As a result of that activity, for the first time, I saw my own presentation. I saw lot of improvements on me than my undergraduate presentations as well as weaknesses. Still I was not friendly that much to the audience. There were no proper eye contact with the audience, and I was looking the audience and immediately taking my eyes off. But, with the time I was able to improve my eye contact and use of gestures.
8.3. Self, Student and Peer Feedback for Lectures

From the past reflections of my presentation skills, I have already identified some areas which I have to improve, such as, use of eye contact and use of gestures. My first lecture was Networking Technologies (CS 3015) which I did for science faculty 3rd year general degree students. I had around 35 students in the class. I could not imagine what will happen in the first day of that lecture. I did not know how much PowerPoint slides I need for a two hours lecture. I did not know how the class looks like and how I will look like in front of the class.

After doing the first lecture, I could not remember what I have covered in the class. Anyway, I knew that I did it better than I expected. Since I was not confident enough, I had finished the two hours lecture in about one hour while consuming all the slides I have prepared. However, with the time I could manage the time and I have been explaining the things bit more elaborately. In addition, I was able to develop my awareness of doing the lecture in class. But still, I could not manage more complex subject knowledge well.

I gained my second experience from Introduction to Data Structures and Algorithms (CS 3008) which I did for science faculty 3rd year joint-special degree students. Again around 40 students followed that course. I faced a bit difficulty of doing effective lectures in the class, because the class room did not have a multimedia projector to play PowerPoint presentations. I had to write everything on the blackboard and I had to waste lot of time on writing things on the board. However, I practiced doing two advancements to my teaching. Firstly, I tried to improve my explanatory skills while using the blackboard. Secondly, I gave small exercises in middle of the lectures to see whether the students are on the track. This way I could improve the interactivity of lectures (active learning).

Next, I exposed to do lectures for Applied Robotics and Embedded Systems (SCS 4013) course module which I did for UCSC 4th year special students. Since this subject appeared concurrently while I was following the CTHE course, I could apply lot of improvements. However, only eight students have been registered (only 12 students registered for the 4th year). This course is important to me personally because of the fact which I have discussed under chapter 4.
In my Learning Agreement Number 04, I have proposed to write down few statements on the board at the end of the lecture to see whether I have achieved the learning outcomes of that lecture. The implementation of this change is visible from the lecture plans of SCS 4013 (see section 5.05). I have used these feedbacks in order to plan the forthcoming lectures. However, the feedback was only about the subject knowledge and limited in scope.

Meanwhile, I have encouraged the students to write letters (emails) to me. The following is an email I received from a student who had faced difficulties in selecting an appropriate research paper for the 4th course Research Seminar.

Dear sir,

As we are suppose to present a research paper for the course module of “research methods”, I hope that you will be able to help me with finding suitable papers.

I’m interested in studying research papers based on instead systems, sensors and networking.
Following are some of the articles I was interested in.

http://research.microsoft.com/research/EmbeddedSystems/EWS/

Thank you,
Kanchana Senevirathna.
(4th yr UCSC)

I replied the student in the following manner:

Hi Kanchana,

I was trying to download the papers you have pointed out in your email, but I have failed due to slow connection speed. Anyway thank you for sending the full papers.

The good side of your paper is that it explains the applicability of XML to embedded devices (I think). But in theoretical perspective it is just an applied research (?). So if your intension is research then there are lots of theoretical research papers, where you can learn how a hypothetical research problem has been approached instead of building just standards. However, this is only my opinion.

So, please let me know your intension of this. May be it is good to proceed with your current selection. It has lot of industrial relevance.
As a result of my email the student had decided to select a theoretically strong research paper for the seminar.

To elaborate the feedback, I have planned to give a lecture evaluation questionnaire to students. This change has been proposed by my Learning Agreement Number 09. I got responses from all the eight students who were following the course. However, I could not do two evaluations, one at the middle of the course and one at the end, because of limited time. Therefore, I did the evaluation two weeks before the last lecture (see Appendix B for a sample). The following summarizes the output of that evaluation.

---

**University of Colombo School of Computing**

**Course Evaluation Form for SCS4013 – 2.2007**

The purpose of this questionnaire is to obtain your views and opinions about the lectures you have been given during the course and to help the lecturer evaluate his/her teaching. Please ring the response that you think is most appropriate to each statement. Expand your views by making your comments/suggestions on appropriate boxes.

You may chose from a scale where (1) means that you strongly disagree with the statement and (5) means you strongly agree.

<table>
<thead>
<tr>
<th>Strongly Disagree (SD)</th>
<th>Disagree (D)</th>
<th>Neutral (N)</th>
<th>Agree (A)</th>
<th>Strongly Agree (SA)</th>
</tr>
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<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</table>

Your attendance (%): Date:

<table>
<thead>
<tr>
<th>A. The Course</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
</table>
1. **Amount of work I had to do in this course was reasonable** | 50% | 50% |

2. **Outline of the course was followed closely throughout the course** | 25% | 50% | 25% |

3. **Learning outcomes have been made clear** | 14% | 57% | 29% |

4. **Text books and other references prescribed for reading have been useful** | 13% | 25% | 50% | 13% |

5. **Handouts and notes have helped to understand the course better** | 57% | 43% |

6. **Inviting guest lecturers from other related areas and industry was worthwhile** | 13% | 13% | 63% | 13% |

7. **Other aspects you would propose to improve the course:**
   - More microcontroller programming, assembly and c programming (111).
   - Group project to develop microcontroller robot than LEGO robot (1).
   - More practical discussions and limited content (1).
   - Reduce the number of practicals and use something else than a poster (1).
   - Provide the PPT slides used in the lecture (1).

**B. Learning**

1. **I would recommend this course to other students** | 25% | 50% | 25% |

2. **I have become more interested in this subject or subject area** | 38% | 50% | 13% |

3. **I felt comfortable asking questions in the class** | 13% | 13% | 63% | 13% |

4. **The lecturer answered my questions in a way which helped me to learn** | 13% | 75% | 13% |

5. **Other aspects you would propose to improve your enthusiasm of learning:**
   - Course content is high, 2 hr lecture is not enough (1).
   - Enjoyable subject, establish a robotics society (1).
   - Bit difficult to understand some concepts, better to simplify them (1).
   - Focus more on embedded systems and their applications in the industry (1).

**C. Teaching**

1. **The teacher has been punctual** | 13% | 88% |

2. **The teacher has prepared well for the class** | 25% | 50% | 25% |

3. **The teacher explains the “things” clearly** | 13% | 13% | 50% | 25% |

4. **The teacher’s speech is clear and easy to understand** | 13% | 25% | 63% |

5. **The teacher is able to teach at the students’ level** | 22% | 56% | 22% |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>13%</th>
<th>25%</th>
<th>50%</th>
<th>13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Writing has been clear and legible</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7.</td>
<td>Illustration and examples have been used sufficiently</td>
<td></td>
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<tr>
<td>8.</td>
<td>Explanations have been given in sufficient detail</td>
<td>13%</td>
<td>75%</td>
<td></td>
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<tr>
<td>9.</td>
<td>Teacher-student discussion has been encouraged</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10.</td>
<td>Good use has been made of audio visual aids to illustrate points</td>
<td></td>
<td></td>
<td>100%</td>
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</tr>
<tr>
<td>11.</td>
<td>White board has been used well</td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>12.</td>
<td>The teacher has wide subject knowledge</td>
<td></td>
<td></td>
<td>75%</td>
<td>25%</td>
</tr>
<tr>
<td>13.</td>
<td>The teacher has been available for consultation outside the formal classes</td>
<td></td>
<td></td>
<td>38%</td>
<td>63%</td>
</tr>
<tr>
<td>14.</td>
<td>Other aspects that would help the lecturer to improve his way of presentation:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Breaks in the speech (1). Use more examples and simulations (1). Use PPT instead of PDF, do not give the impression that you are presenting someone else’s note (1). Improve the teaching materials in attractive way (1). Beter to recommend more learning materials (1).</td>
<td></td>
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</table>

**D. Laboratory Practical**

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<tr>
<th></th>
<th></th>
<th>13%</th>
<th>75%</th>
<th>13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Laboratory practical were useful and linked to the topics of the course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Laboratory sheet has helped to understand the practical well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Facilities (equipments) provided for practical were satisfactory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Assistance provided for practical were satisfactory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>The reports that had to be produced at the end of practical helped me in my learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Other aspects you would propose to improve the effectiveness of laboratory practical:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Lab space is not enough (1). Rearrange the lab practicals according to their complexity (1).</td>
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</tbody>
</table>

**Figure 16: Course evaluation of SCS 4013**

After analyzing the feedback I have arrived to the following conclusions (but not limiting to):
• The students have a clear understanding of the course. This may be because I have stated the learning outcomes at the beginning and I have given a course handbook which contained schedules, assessment and most essential details about the course
• Students would like to have more lectures on microcontroller programming. I have allocated only 4 lectures on microcontrollers this time, because I had lot more content on robotics. May be from next time, I need to put more emphasis on microcontrollers
• Some students have suggested limiting the content. May be I would try to present the content in a different way. Otherwise, I will not be able to achieve the learning outcomes
• In general, students are happy with my lecturing style. But, at the same time they have suggested me to improve some aspects, such as, minimizing the breaks in my speech
• I have to redesign and rearrange the laboratory practicals in a way of growing complexity

Still, my evaluation methods are something designed by me. But, I knew that there can be more aspects which I am not aware of and which I should consider in my journey of becoming an effective teacher. The student’s questionnaire is only a one way of getting feedback. To recover those other aspects, I have proposed a peer evaluation in my Learning Agreement Number 06.

In that learning agreement I have proposed to consult three peers: a senior academic, a colleague and a junior academic. For the evaluation, I thought it might be productive if I give the opportunity to the peers to decide on the criteria. However, my tutor has suggested mentioning the reviewers the areas of my work/teaching I may like to receive feedback on.

For realization of this change, I have invited a junior academic to sit on my lectures without considering my tutors suggestion (because I wanted to see what is happening). After, two lectures, I asked that reviewer for feedback. But his answer was “your lecture was ok”. Then, I mentioned about several aspects where I was liken to see my rank. But still that person’s feedback was same and not supportive at all. This was not what I have expected. Therefore, I went for a second reviewer. This time a senior academic and I showed the Checklist for Peer Observation of Teaching table which is in the course handbook of CTHE. Further, I mentioned some areas where I would like to receive feedback on (tutor’s advice). As a result,
I received the following feedback from him. However, I was reluctant to accept some points he had mentioned, because those were applicable only for that particular lecture. Therefore, I invited him to participate to several other lectures, so that he can give more balanced feedback. Still, I was honest to analyze those points and take necessary actions to improve myself.

- (-) Could have asked the questions before showing the slide. Could have given several “behavior” examples and stimulated students to give answers:
  This happened because I have asked questions while the answers for those questions were visible on the projected slide. I can improve this aspect without much difficulty by showing (mentioning) the answers after I get sufficient response from the audience

- (-) Get more familiar with the slides and speak looking at the class. Felt too much explanation or time taken to explain the “red spot bird” thing:
  This is applicable only for that particular lecture. In the morning I had to participate to evaluation of some other subject and as a result I did not have time to organize myself for the lecture or go through the notes for one last time, which I do in other lectures

- (-) Change voice (volume, pitch, speed, etc.):
  This is something I should improve consciously

- (+) “Internal motivation” (“innate releasing mechanisms”) explanation is good:
  I should continue this behavior of explaining things

- (-) Low degree of gestures (handout on one hand and mouse on the other) and low level of physical movement:
  Sometimes I am holding the handout on one hand for fast access of information. I have to use the other hand to manipulate the presentation. As my reviewer suggesting, this might be inappropriate from the perspective of audience. Therefore, I should try to free my hands much as I can and try to move my body

- (+) Eye contact toward the audience is good:
  I should continue this behavior

- (-) Students showed very little engagement (sleepy), may be due to the time:
  Again this lecture is in the afternoon from 1-3 pm. I am always trying to use active learning activities. But, whenever the lecture has passive components students fall into sleepy moods

- (-) “Implicit chaining” slide did not show that they are happening in parallel:
Some mistake in the slide
• (-) Felt that you are not so familiar with the slides:
  This is again because of I could not do a last minute rehearsal
• (-) Scrolling back and forth in slides. Could have written down the important points
  on the white board to later reference or just mention them out of your memory:
  This is again because I could not do a last minute rehearsal. I had to recover my
  memory at one or two instances by scrolling the slides. I think this should be expected
  in lectures. But in my case I forgot to inform the students that I am doing it purposely
• (-) When asking a question from students give more time, stimulate students with
  queries and build up asking student responses and try to get the answer from students:
  I should give more time. Sometimes, I have to limit the time to achieve the planned
  learning outcomes of that lecture
• (-) Think you took too much time to remind “perception” to students:
  Sometimes when it encounters an interesting topic for me, I tend to talk more on that.
  I connect it to already done lectures and try to expand the understanding. Therefore, I
  do not see an error of this conduct if I can control myself

Note: Positive feedback are marked by putting (+) symbol in front of text and negative
feedback using (-) symbol

The above three methods, self evaluation, student questionnaire and peer evaluation, helped
me to estimate my teaching role in several ways. However, still I have a long way to go. I am
still in uncertainty in enabling small group discussions in lectures. I could not effectively
practice this method in my current lecture because there are only few students doing the
course. But, I have planned to practice this in the next semester in the course Introduction to
Data Structures and Algorithms (CS 3008). This change has been suggested under my
Learning Agreement Number 08.

8.4. Self, Student and Peer Feedback for Coordination

I have experience in coordinating the final year projects of computer science special degree
students for more than two years. In that effort I received enormous advice from senior
academics. In addition, I have used my own experience of doing my final year project and
coordination I received when doing my project. As a result, I was able to improve the outcome of final year projects as a result of continuous monitoring of their progress.

Since last year, I have been assigned the responsibility of coordinating the courses ICT 2002 and ICT 2012 (for a detailed description of these subjects see the section 7.8). The progresses of students’ projects doing under these subjects are somewhat ubiquitous because of the nature of the projects. Therefore, I have planned to do an evaluation for the coordination using a student questionnaire. This change has been proposed under my Learning Agreement Number 10. The following is the outcome of that evaluation (see Appendix B for a sample).

**University of Colombo School of Computing**

**Course Evaluation Form for ICT2012 – 2.2007**

The purpose of this questionnaire is to obtain your views and opinions about the course to help the coordinators to better organize the course. Please ring the response that you think is most appropriate to each statement. Expand your views by making your comments/suggestions on appropriate boxes. **DO NOT** write your name.

You may chose from a scale where (1) means that you strongly disagree with the statement and (5) means you strongly agree.

<table>
<thead>
<tr>
<th>Strongly Disagree (SD)</th>
<th>Disagree (D)</th>
<th>Neutral (N)</th>
<th>Agree (A)</th>
<th>Strongly Agree (SA)</th>
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<td>1</td>
<td>2</td>
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<td>5</td>
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</table>

**Group No:**

**Date:**

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<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Amount of work I had to do in this course was reasonable</td>
<td>3%</td>
<td>14%</td>
<td>55%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>2. Learning objectives have been made clear</td>
<td>24%</td>
<td>14%</td>
<td>41%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>3. Having strict deadlines is good</td>
<td>14%</td>
<td>14%</td>
<td>41%</td>
<td>31%</td>
<td></td>
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<tr>
<td>4. Your suggestions/comments to improve the course: Need excuses for deadlines when unavoidable circumstances. Need more resources on</td>
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</table>
the LMS like tutorials and links. Conduct workshops using Sinhala & Tamil. Introduce practical sessions. It is sometimes difficult to meet the client. Good to understand real project.

5. Our group is functioning well
   - 7% 21% 55% 17%

6. Each member of our group is contributing equally
   - 18% 14% 25% 36% 7%

7. Our client is really helpful and available for consultation
   - 14% 21% 31% 34%

8. It is good if marks are allocated group wise, equal marks to each group member
   - 14% 4% 29% 39% 14%

9. It is good if marks are allocated individually to each group member based on their contribution
   - 29% 39% 4% 29%

10. If 9, what is the evaluation method you propose?
    Group members who are not cooperating should be identified and advised. If individual allocation, what if there is a mistake. Additional marks to who contributed well. Ask questions from each member. Presentation alone is not enough. Ask questions from each member about their contribution and give marks. Viva test to check each member’s contribution.

11. What are the difficulties you or your group experiencing?
    Need knowledge on how to collaborate work when sharing database with another group. Allocate workload among group members. Helpful if supervisors are assigned to each project. Guidance for implementation. Working at the last moment and not as a group. Only 1 or 2 persons doing the projects, others work for their exams. Time management. Do not have enough computer facilities. Violation of human rights.

12. The crash course is helpful to understand the subject matters well
    - 19% 19% 44% 19%

13. Please complete the following table as you feel about the crash course:

<table>
<thead>
<tr>
<th>Lecturer</th>
<th>Aspects covered</th>
<th>Things you applied in your project</th>
</tr>
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14. What else you would like if covered under the crash course?
After analyzing the feedback, we have done two changes for the time being,

- We faced a difficulty when deciding which method to use when allocating marks to group members. The feedback for questions 8 and 9 do not suggest either method, because there is no clear difference between scores. However, students have indirectly suggested allocating marks individually and they were uncertain about the technique we should use. Finally, we have decided to use a peer evaluation method and the implementation of this method has been discussed in the section 7.8

- Students have suggested of having lectures on DBMS & SQL, PHP, JavaScript, Data Security under crash course series. Responding to this, we have organized few lectures to cover these areas

It was bit difficult to get more information out of this questionnaire, because of the way it has presented its questions. Therefore, I have decided to change this questionnaire to improve its focus to get a better outcome (feedback) next time.

### 8.5. Observing Peers

For ICT 2012, we have decided to organize a crash lecture series to help students to improve their knowledge on some areas essential for their group projects. As a result, we have invited
some lecturers to deliver lectures. Since I am one of the organizers, I got the chance to participate to those lectures. There I saw how other lecturers are delivering their lectures and the techniques used by those lecturers to improve students’ engagement in learning.

In addition, I was able to participate to the 4th year course Research Seminar, which is a discussion based learning environment and it was coordinated by one of my colleagues. There I saw how he is managing a large class discussion by maintaining the track of the discussion. He was able to motivate the students to ask questions and finally students got self-motivated to ask questions and answer each other’s question.

CTHE seminar presentations were another learning environment where I saw how lecturers from other disciplines conduct their lectures. We all have to deliver a 15 minutes presentation for an inter-disciplinary audience. In that we have to focus on each one’s background and adjust our presentations accordingly.

I have included a review of CTHE to express my review of CTHE course under the section 8.6.

8.6. Review of CTHE

Why CTHE has achieved its outcomes?
- It is a requirement for probationary lecturers to obtain CTHE to get confirm in their post
- Punctuality of the tutor and the staff
- Put learners into self reflection rather than instructing
- Differed learning environment (groups, activities, etc)
- Motivation to show performance through learning agreement submission and portfolio chapter submission

Why CTHE has failed to achieve its higher level outcomes?
- One philosophy or viewpoint (virtually one tutor) and uniformity in sessions. Would have invited more guest lecturers
• Detailed activities and forms, for instance, it was very difficult to understand the layout and logic of the learning agreement form. May be good if the learning agreement form started with few number of fields and developed with more fields as we get familiar with it

• The class setup was bit uncomfortable because of the limited space and high crowd. Therefore, the motivation and engagement was disturbed

• Not enough sense of participation for silent contributors. May have used a mixed set of techniques to energize the participation at individual levels, group levels and as a whole (both bottom-up and top-down)

• The learning agreement submission and portfolio chapter submission schedules were not realistic. We could not understand what a portfolio is until we reached the latter part of the course. But then we ended up with limited time to complete the portfolio. It may be good if we were given enough instructions/guidance to draft a portfolio chapter at the beginning and let us submit an interim portfolio

The following may have contributed to the performance of CTHE either positively or negatively:

• The groups have been fixed from the beginning. Therefore, there was no recognition or opportunities to share between others other than within my own group. This setup characterized a degrading performance in groups. It may be effective if there were some activities beyond barrier

• Rigid attitudes of participants and their varied disciplines. It was very difficult to come into conclusions most of the time due to varied experiences between the participants and this has resulted locality in their objectives towards their ends

This review on CTHE has helped me to identify what I can practice in order to improve the outcome in a similar learning environment.

8.7. Reflections and Commitments to SEDA

This chapter has discussed my commitments for evaluating my teaching role and related activities. It started the discussion by presenting my reflections on presentation skills and my
evolution as a teacher. It then discussed the techniques I have used to evaluate my teaching and coordination roles. In that effort, I have used three types of methods: self evaluation, student evaluation and peer evaluation. Next, I have presented how I have evaluated other’s teaching and related activities. Therefore, the chapter demonstrates my achievements of the following SEDA outcome(s):

- **use** a variety of methods for evaluating your teaching role (SEDA outcome)

After analyzing the results of feedback, I was able to identify how I should improve the courses, for instance, from the feedback we received for ICT 2012 we have identified that the students need few lectures on some specific aspects (section 8.4); responding to their need, we have managed to deliver few lectures on those areas. Addition to feedback discussed here, I have used in-class exercises to identify how I should extend my teaching approaches (section 6.5), and I was able to improve my lesson planning as a result. This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

- **identify** your own professional development goals, directions or priorities
- **plan** for your initial and/or continuing professional development (SEDA outcome)
- **undertake** appropriate development activities (SEDA outcome)
- **review** your development and your practice, and the relations between them (SEDA outcome)

The discussion of this chapter starts with discussing my continued reflection since I started to acquire my presentation skills (section 8.2). Peer feedback for lectures (section 8.3) has helped me to identify more aspects which I have to improve. Therefore,

- **Continued reflection on professional practice** (SEDA value)

When designing these reviewing techniques, I have consulted enough literature. Sometimes, I have discussed with seniors to identify better ways of doing such an evaluation. I was honest enough to present the actual data and actual decisions I have taken in such occasions without any alternation. Therefore,

- **inform** your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
- **Scholarship, professionalism and ethical practice** (SEDA outcome)
When I was designing student questionnaires, I have tried to make it friendlier to students. I have anticipated how a student might interpret those questions and give answers. Even though, I have failed to maintain this practice for some questions, majority have produced the answers in the anticipated way. Therefore,

✓ An understanding of how people learn (SEDA value)

The section 8.3 has discussed an instance where I have supported a student to select a research paper for some course. In addition, I have included some fields in the student questionnaires to write the problems the students might have, and responding to these issues the chapter discusses some actions I have taken in order to support the students. Therefore,

✓ provide support to students on academic/pastoral issues (SEDA outcome)
✓ Working effectively with diversity and promoting inclusively (SEDA value)

Since we who participated to CTHe workshops are discussing about student questionnaires, peer evaluations, etc. it has motivated other staff members to incorporate those techniques to their teaching practices as well. The person I have consulted for my peer review has become a good peer reviewer, because he has been consulted by many other staff members. Therefore,

✓ Working in and developing learning communities (SEDA value)

The primary objective of reviewing teaching is to improve my learning, teaching and assessment approaches. For instance, when I was describing assessment approach of ICT 2012 (section 7.8) I was in a puzzle whether to award marks individually or to the group for group projects. But, I could resolve this situation as a result of student questionnaire after students have agreed for individual awarding of marks. Therefore,

✓ extend your use of learning, teaching and assessment approaches (SEDA outcome)
✓ contribute to the process of module/program design, implementation and evaluation (SEDA outcome)
✓ The development both of people and educational processes and systems (SEDA value)
Chapter 9. Being an Effective Academic

After deliberately reading this section the reader will be able to (but not limiting to),

- Recognize the values of professionalism and ethical practice, and working effectively with diversity
- Identify why someone would need to organize him/her self
- Describe self-management in contrast to time-management
- Describe self-organization with respect to dealing with papers, desk organization, etc.
- Describe self-management with respect to dealing with priorities, tasks, etc.
- Recognize the benefits of participating to meetings, seminars, etc.
- Evaluate commitments and achievements of SEDA outcomes and values

9.1. Introductory Remarks

This chapter discusses my continuous commitment towards being an effective academic. Here my discussion basically concentrates on my self-organization with respect to time and tasks. In addition, I am trying not to avoid any duty which has inherited into my responsibilities. This can be seen form my reflections on participating to meetings, workshops, etc.

Finally, there is a discussion to reflect my achievements of SEDA outcomes and commitments to SEDA values.
9.2. Self-Organization

9.2.1. Introduction and Motivation

“Being organized does not mean being tidy, does not mean paying attention to detail, does not mean constructing yourself and shifting your creativity, and it does not mean that you are a certain type of person. Being organized is not about diaries, filing cabinets and so on, it is about you and your work. It is about being effective in your work.

It is easy to start to be better organized. When you see the benefits you will be motivated to continue. Being organized is a skill. Like all skills, being organized is not simply a matter of finding things out, it is a matter of application and practice. As you develop your system you become more effective and less stressed.”

Johnson L. (1996)

If someone had visited me around one year ago, he/she should have seen papers all around my desk and I am struggling to find things out while I am doing my day-to-day activities. In addition, I had a greatly disorganized personal computer and I was wasting considerable amount of my valuable time searching files.

I have observed similar practices by lot of staff members in my workplace. I also have suffered many times because of such unorganized self characters. In one case, I have purchased some books for my studies sometimes back and I requested for reimburse through my immediate superior attaching all the necessary details and bills. After sometime, when there was no response, I tried to follow-up what has happened to my request. Then I got to know that my superior has misplaced the request in his room. I requested him several times to find that request, but he was so reluctant to search it since his desk as well as the room was really a jumble. It took more than six months to recover my request, but at that time the request was invaluable.

I know that day-by-day I am developing in my academic career and I am advancing with more and more responsibilities and work. I know that these kind of incidents could be even
possible with me if do not organize myself properly. Therefore, after reflecting, I adapted of proper ways of organizing myself at my workspace as well as at home.

9.2.2. Dealing With Paper

Among the first things I have observed with my earlier paper handling were, I am not discarding unnecessary papers thinking that I have to deal with them “some-day” or to reuse the empty spaces of those papers. In addition, I was stacking all “necessary” papers without ordering them properly. Johnson (1996) summarizes some better ways of organizing someone’s papers. The following are some of the policies I have incorporated when dealing with paper:

- Categorize my workload and maintain a file for each of those categories. For instance, if I consider about the course SCS4013, I have at least 3 files: notes, assignment submissions and extra notes
- I have ordered the files according to their relative importance, such a way that in the top I can find the files whose tasks are frequent. I am removing the files whose tasks are no longer dealt in the present time to my small cupboard
- All the files are kept behind my desk. This way I am maintaining a clear desk and no papers to distract me
- I am discarding any unnecessary papers where I can live with the consequences of discarding them. To support this I am doing regular checkups of my files to uncover the papers those are no longer important for my. Further, I am trying to adopt the policy of not filing myself anything which someone else files as part of their job

9.2.3. Desk Organization

Earlier I had a highly disorganized desk. I was placing paper and stationary all over the desk. Finally, I end up with a little workspace and my pressure goes high when I see the desk.

However, later I decided to maintain a clean desk as part of my self-organization plan. I purchased a stationary holder and put all my pens, clips and other tools into it. I also purchased whatever necessary for my day-to-day activities, such as, gum, scissor, cello tape, paper-cutter, etc. Only my personal computer, the stationary holder and my diary (organizer)
is present in my desk all the time. Other than that the desk is clean unless I have some complex task to do. But as soon as I finished a task I clean the desk. In addition, I have paste-it notepad on my desk, where I can write short messages and paste a note on someone else’s desk if that person is not present at the moment. This is very much important when someone from telephone asks to leave me a message to someone in my room.

9.2.4. Organizing Personal Computer and Emails

Keeping the personal computer in an organized manner is not an easy task. I have experimented several ways of organizing my work in my computer. However, I have failed almost all of them because I have two computers, office computer and home computer, and I have to synchronize my work on both of them, I have several versions for one file, I have to keep backups and sometimes the files get corrupted or the whole system crashes because of viruses and other troubles. However, at the end I decided to adopt a policy of discarding unnecessary files like I am now tackling with papers. But, yet I do not have a good policy.

Earlier I was not deleting the emails from my mailbox thinking that I will need them “some-day”. But finally I ended up with a large archive consuming considerable amount of space of my quota limit. Therefore, I decided to delete all unimportant mails and less-important emails that can be recovered from official achieves. Now, I am maintaining only one screen of email list all over the time while removing anything after their usable time has passed.

9.3. Setting Priorities

9.3.1. Introduction and Motivation

The priority you place on something is not a natural property you recognize in it. The priority you place on it is an expression of how doing it furthers your goals. The better you prioritize the more you are to realize your goals. By the same token, the better you know your goals the better you are able to prioritize.
An essential part of being effective is to devote your time on proportion to your priorities. The most difficult part of managing your time is linking your schedules and your To Do list to your priorities.

Johnson L. (1996)

9.3.2. Goals and Tasks

Goals are our ambitions and desires – what we want to achieve. Goals should spring directly from our values. If not, we are unlikely to attain that particular goal; since we shall be working against ourselves.

Goals cannot usually be achieved by a single action alone, but usually take time and many activities before they are realized. (CTHE course notes)

Johnson (1996) categorizes goals into two: long-term goals and medium-term goals. After thinking about my goals I have identified my goals for two years period from this year. My long-term goal for the next 10 years period is to become a senior lecturer with all the basic qualifications. In addition, I should become well known in research. To achieve this long-term goal, I took the next step of identifying the medium-term goals for this and coming years:

- Complete the CTHE course successfully
- Complete my M.Phil successfully
- Complete TOEFL and GRE examinations successfully and obtain a scholarship for my PhD studies
- Become eligible for reading for a PhD in a world top ranked university

Setting goals is not enough to achieve them. The next step is to identify the tasks which realize their consequences. For instance, to realize my goal of completing the CTHE course successfully, I should achieve the following tasks:

- Participate at Workshop Number 1
- Achieve an 80% attendance record
- Submit at least 7 learning agreements
- Receive a satisfactory grade for my seminar presentation, and
• Receive a satisfactory grade for my portfolio

This effort of identifying my goals and tasks has been addressed in my Learning Agreement Number 05.

9.3.3. Progress and Maintenance Tasks

The tasks are classified differently. One classification is based on progress and maintenance tasks.

A progress task is one which you believe may move you towards a position which is better than the one you are in now. For instance, changing to a new car.

A maintenance task is one which will move you towards a position equivalent to the one you are already in. For instance, filling a car with fuel.

(CTHE course notes)

After formally knowing about these two tasks, I have tried classifying my everyday tasks according to this.

• Clean my desk and room (maintenance)
• Check emails (maintenance)
• Passive lecturing (maintenance)
• Attending CTHE course (maintenance)

Then I realized that all most all the tasks I carryout each day are maintenance tasks. However, later I realized that some of them are progress, such as, attending CTHE workshops, where it gradually helps me to achieve my major task of achieving 80% record and finally the medium-term goal of successfully completing the CTHE course. Finally to my ultimate goal.

The literature suggests that the people who are usually judged to the most effective are the ones who carryout successfully the progress tasks rather than maintaining the status quo. Therefore, I tend to prioritize progress tasks in my daily schedule than maintenance tasks. This practice has been discussed under my Learning Agreement Number 05.
9.3.4. Urgent and Important Tasks

Another classification categorizes tasks in a quadrant which is given below (adopted from CTHE course notes and Johnson, 1996):

<table>
<thead>
<tr>
<th>Important</th>
<th>Urgent (Pressing)</th>
<th>Not Urgent (Not Pressing)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>These tasks should be my top priority and need attention now. E.g.</td>
<td>These are not top priority, but they should still be slotted into my schedule. E.g.</td>
</tr>
<tr>
<td></td>
<td>- Marking of some reports to release the results on time</td>
<td>- Completing my portfolio</td>
</tr>
<tr>
<td></td>
<td>- Preparing for tomorrow’s lecture</td>
<td>- Write a research paper on my latest findings of my M.Phil research</td>
</tr>
<tr>
<td></td>
<td>- Prepare the progress report of my M.Phil to submit it by tomorrow</td>
<td></td>
</tr>
<tr>
<td>Not Important</td>
<td>These tasks need time now, but not too much as my priority is to work on the Urgent and Important tasks. E.g.</td>
<td>Should I really be doing these tasks at all? E.g.</td>
</tr>
<tr>
<td></td>
<td>- Attend today’s meeting</td>
<td>- Some phone calls</td>
</tr>
</tbody>
</table>

Figure 18: Types of activities: important versus pressing

An urgent task is one that ‘if it is not completed by certain time, its benefits to me and others will be reduced, or even cancelled’. An important task is one that ‘if it is successfully completed, I and others will reap high benefits’. The higher the benefit, the more importance the task should be given.

After classifying my tasks under these categorizations, the next step is to prepare a To-Do list.
9.3.5. To-Do List

A To-Do list is a collection of tasks we have to carry out day-by-day. When it is preparing we prioritize the tasks according to their relative importance and urgency (see 9.3.4). Johnson (1996) suggests a better way of prioritizing the tasks using the ranks A, B and C.

- A: tasks that are important and pressing
- B: tasks that are important but not so pressing
- C: other tasks

There is a popular story we can find from the literature, which tells us how successful we can be if we follow the correct way of organizing our tasks. The following is that story I have copied from the Internet (I could not find the exact author):

A college professor stood before his philosophy class with several items in front of him. When the class began, wordlessly he picked up a very large and empty glass jar and proceeded to fill the jar with golf balls. He then asked the students if the jar was full. They agreed that it was.

He then picked up a container of pebbles and poured them into the jar. He shook the jar lightly. The pebbles rolled into the open spaces between the golf balls. He then asked the students again if the jar was full, to which they replied, “yes!”

Next, the professor picked up a box of sand and poured it into the jar – the sand sifted down into the tiny spaces between the pebbles. Once more, he asked, “Is the jar full?” to which most of the students again replied, “yes.”

The professor then picked up two cans of beer from under the desk, and poured them into the jar – which filled up even the spaces between the grains of sand. The students laughed.
“Now,” the professor said, “I want you to recognize that this jar represents your life. The golf balls are the important things – your family, your friends, your partner, your health, your passions – things that if everything else was lost and only those remained, your life would still be full.

The pebbles are other things that matter – your job, your house, your car. The sand is everything else – the small stuff. If you put the sand into the jar first,” he continued, “there wouldn’t be room for the golf balls or even the pebbles. The same goes for your life. If you spend all your time and energy on the small stuff, you’ll never have room for the things that are really important to you.

Pay attention to the things that are critical to your happiness. Play with your children. Take your partner dancing. Get medical checkups and go to the gym. There will always be time to go to work, to do housework, and to fix the disposal. Take care of the golf balls first – the things that really matter. Set your priorities – the rest is just sand.”

One of the students raised her hand and asked, “What’s the beer represent?” The professor smiled. “I’m glad you asked. It just goes to show you that no matter how full your life may seem, there’s always room for a couple of beers.”

I am preparing a To-Do List for each week and then I transfer the items into the day planner section of my diary. Instead of ranking the tasks as A, B and C I use stars, i.e. ‘*’, to prioritize the tasks. For instance, the following is my To-Do List appeared on 21st of May,

- Get IITC proceedings from Ranuka
- Update BIT website *
- Prepare a plan for ICT2012 *
- Inform the staff to participate for SCS4013 group project evaluation **
- Prepare lecture notes for SCS4013 *
- Read the paper for next research seminar **
- Prepare laboratory sheet number 5 **
As I complete the tasks I strikethrough the items and attach details. If I did not able to complete an item, I simply draw an arrow heading pointing the next day.

In addition to To-Do Lists I am using the Year Planner facility of my diary to schedule my major tasks throughout the year. In that I have pointed out the days I have to attend for CTHE workshops, academic meetings, examination dates and other deadlines.

Yet I am not efficient in planning my day well. One another advancement I introduced to my day planning is to adapt to a timetable, which is discussed under 9.3.7. In the mean time I am learning other better ways of preparing a To-Do List.

**9.3.6. Avoiding Unimportant Tasks**

One issue I face after I got able to manage my time is interruptions by others. Most of the time seniors assign works unexpectedly, and this results me to revise my schedules regularly. I can not refuse some of this unexpected work, because they are part of my academic duties. Therefore, I took measures to avoid unimportant tasks as much as I can.

As soon as someone asks me to do something, the first thing I do is determining its priority against my values and goals. If the task is not important to me, I simply avoid the task by saying something like “Sorry, these days I am busy with my portfolio writing and examination paper settings. Therefore, could you please ask from someone else?” This practice has helped me to avoid considerable amount of unimportant tasks and to save my time to put my efforts into some important tasks. As a result of my behavior, now other people have stopped bothering me that much. However, I see some bad sides of this behavior as well. I am loosing some interesting (may not important) opportunities as well.

**9.3.7. Timetable**

As I discussed in 9.3.5 I first practiced preparing To-Do Lists for my day-to-day tasks. However, I realized that it alone can not help me to reach to my planned goals well. Some tasks are frequent, such as, preparing lecture notes for some course, and if I can allocate a
dedicated time period I can complete those tasks well. On the other hand, there are tasks which are not pressing, such as, doing my M.Phil research, and they always get lower priority and likely to ignore. In addition, there are tasks which are not important that much or not pressing, but still they are part of my duties, such as, student contact.

To better facilitate these tasks, I first prepared a timetable for my after-hours tasks, which I have discussed under my Learning Agreement Number 05. Later, I extended this timetable for my day-time activities as well and this has been discussed under my Learning Agreement Number 11.

In the above learning agreements, my tutor has suggested me to further divide the slots to allocate different activities. To reflect this I am hoping to introduce activities to my next semester’s timetable.

9.4. Participating to Seminars, Workshops and Meetings

Participate to academic meeting is a compulsory duty for us (see Appendix B). I do participate to such meetings unless I have to face an unavoidable situation. Even though, I feel uncomfortable due to long hours of sitting in such meetings, the participation is very much important in many ways, such as, I get updated about what is now happening in the institute, I can correct if something has recorded incorrectly, etc. In addition, I have analyzed the whole structure of some of those meetings and found that I can develop a similar structure for the coordination effort of the course ICT 2012. There are three coordinators in the course and sometimes the academic coordinator for BICT is also participating to our meetings. Earlier, our practice was, we discuss the things thoroughly, but we do not write down our decisions and we forget things very quickly. Then when it comes to execute those decisions, no one bears the responsibility of such decisions.

To resolve this situation, I thought it might be good to minute the decisions and finally get signatures of all the participants. I have attached some samples of those documents into Appendix B.
In addition, I always make myself available for participating to seminars and workshops where I can update my knowledge. One such seminar is the ‘lunch time research seminar’ we have in our institute in every Thursday. The objective of this workshop is to share the current research work done by our staff members as well as foreign visitors to our institute.

9.5. Reflections and Commitments to SEDA

This chapter has discussed my commitments towards being an effective academic. In the past I had lot of difficulties in organizing my time and self. I always felt that I am too much overloaded with work. I was trying to do everything in parallel, and finally end up doing nothing at all. As a result, I felt depressed all the time and I was degrading my health as well as performance.

However, later I was able to incorporate self organizing techniques into myself. I tried to pre-plan my day and I adapted to use a diary. I tried to prioritize my tasks and identified most important and urgent tasks for the moment. I tried to avoid not important and not urgent tasks. However, to contact with all the important tasks (otherwise I would miss), I have adapted to a timetable as well.

Then, I practiced dealing with papers and emails, and ultimately make my working environment organized. I wanted to role model myself, so that, others will judge me as an effective academic and they will also try to be the same. I can even give advices to my students to organize their lives. Therefore,

- inform your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
- Scholarship, professionalism and ethical practice (SEDA value)
- Working effectively with diversity and promoting inclusively (SEDA value)

The chapter demonstrates many instances where I have reflected many changes to my existing work style. For instance, although I have proposed a timetable for my day planning, later I saw that it is not properly tuned. Therefore, later I adopted a different timetable (section 9.3.7). This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:
✓ **identify** your own professional development goals, directions or priorities (SEDA outcome)

✓ **plan** for your initial and/or continuing professional development (SEDA outcome)

✓ **undertake** appropriate development activities (SEDA outcome)

✓ **review** your development and your practice, and the relations between them (SEDA outcome)

✓ Continued reflection on professional practice (SEDA value)

In addition, in the new timetable I have allocated a dedicated timeslot for student contact. The idea of this timeslot is to allow students to discuss their problems with me. Therefore,

✓ **provide** support to students on academic/pastoral issues (SEDA outcome)
Chapter 10. Administrative Duties

After deliberately reading this section the reader will be able to (but not limiting to),

- Recognize the value of working effectively with diversity
- Recognize the assertive characteristics of the author
- Identify techniques which can make someone effective in administrative work
- Identify the duties of an academic other than teaching and learning
- Evaluate commitments and achievements of SEDA outcomes and values

10.1. Introductory Remarks

I got my first appointment in the academic sector as a temporary instructor, and straight away I have been assigned administering one of the student computer labs. At first glance, what I saw was a disordered lab, because few days ago some students had taken the computers out from the laboratory for an exhibition and had just returned the computers without organizing them properly. I saw that the actual users of that laboratory suffering because of this unpleasant practice. Therefore, my first task was to reorder the laboratory to let the students to get the maximum benefit from it.

Soon, I realized that it is not that easy to control a student laboratory. I had to resolve technical problems, conflicts between students, requests from senior academic staff and various other issues. However, with the time I was able to adapt to these tasks and could see beyond my scope of work. I tried to introduce 5S scheme to the laboratory and I could implement it to some level.

Day by day, I had advanced in my seniority and I got my second appointment as a temporary assistant-lecturer. At the same time, the senior academic staff has appointed me as the unofficial co-coordinator of instructors and all the student computer laboratories after evaluating my performance. This time I ended up with a tremendous workload, which included assigning tasks for each instructor, preparing timetables, and arranging laboratories
for assignments. For the first time in my life I saw my duty fullness and I could not free my head from day-to-day administrative tasks.

Because of my continued performance in administrative tasks, the senior academic staff had appointed me as the coordinator of final-year individual projects (there is a discussion under 10.05). First, I thought it is heavy enough to me, so I will not be able to do it well. However, I could learn how to manage it after receiving advices from senior academic staff.

In the successive months, I had to involve in more coordination work, i.e. coordinator of industry relationship (with Mobitel Company), co-coordinator of e-money order project between Postal department and module coordinator of one of external degrees. These experiences have shaped me well to handle tasks in assertive ways. But still I saw that I am very young in my experiences and my coordination compared to other seniors. I always tried to meet seniors to verify my actions, because I was not confident enough with my responsibilities.

In the meantime, I had a developing stress generating on me. I was becoming overloaded with work and I was accepting any work from my seniors, because I was feeble to say ok to seniors. The previous chapter has discussed how I was tackling tasks that have different priorities.

At the end of this chapter, there is a discussion to reflect my achievements of SEDA outcomes and commitments to SEDA values.

10.2. Coordination of Robotics and Ubiquitous Systems Laboratory

Robotics and Ubiquitous Systems (RoUS) Laboratory has founded at University of Colombo School of Computing as a result of my constant effort to introduce robotics into the curriculum (see Chapter 4). The laboratory has been established in February of 2006 jointly with Wireless and Ad-hoc Sensor Network (WASN) Laboratory. I have been appointed as the coordinator of the RoUS laboratory while WASN laboratory has been coordinated by Dr. Kasun De Zoysa, who has been my mentor from the beginning.
At the beginning, the laboratory did not have any robotics related equipments. Therefore, I have planned to purchase some robotics kits. From the initial effort I realized that it is not an easy task. There are government procedures for purchasing items. I had to present quotations from several vendors and recommend one of them based on their price and quality. However, after some months of effort I was able to purchase considerable amount of equipments to the laboratory.

Meanwhile, I have prepared forms for allowing permissions to students to use the laboratory facilities and to issue equipments. I have documents all the purchased equipments with the help of financial department. I have prepared a laboratory ethics notice and pasted it in front of the laboratory (see Appendix B). This way I could introduce some disciplines among laboratory users.

Students now use the laboratory for two reasons: for their final year project and laboratory practicals assigned under SCS4013. I faced a difficulty of administering the lab after more students came to use the lab. To assist me, I had requested an instructor and as a result one instructor has been assigned to the laboratory. Now I am training him on how to administer the laboratory.

10.3. Coordination of BICT Systems Analysis and Design Group Projects

A detailed description of BICT Systems Analysis and Design Group Project (ICT2012) can be found in the section 7.8 above. The following are additional measures taken in order to increase the effectiveness of that effort.

10.3.1. Minuting Meetings

Currently there are three coordinators to coordinate the course ICT2012. I play the main role of that effort. Once in a while we meet together and we plan the next breadth of the course. Earlier, we just limited to verbal discussions and there were no documentary evidence for our decisions. This practice was highly inappropriate, because no one claims for the decisions at
the end. To resolve this situation I have decided to minute the meetings and the way of minuting was adopted from the meeting of Board of Undergraduate Studies. A sample of this document is attached in Appendix B. There is a small discussion on the same topic under the section 9.4.

10.4. Invigilation and Supervision of Examinations

I have involved in invigilating examinations science I joined the academic staff four years ago. I have experience in invigilating B.Sc. examinations of all the years held by the Faculty of Science as well as in UCSC. In addition, I have been invigilating examinations of BIT external degree. The following are some of the tasks I have been involving as an invigilator:

- Make sure that the desks are free of unauthorized materials and in good condition for students
- Paste index numbers in the tables (sometimes numbers are already written)
- Help the supervisor to admit the students into the examination hall. While they are entering I have to make sure that they are only carrying only authorized materials into the hall
- Distribute exam papers as soon as the supervisor give us a signal
- After around 30 minutes, I have to check the admissions and verify that their identities are correct
- Throughout the examination period I have to make sure that the students are not copying
- At the end I have to collect the answer sheets and other papers
- Finally, I have to return the answer sheets to the supervisor after verifying and ordering them
- In addition, I am doing whatever task assigned by the supervisor

Since last year, after I have been absorbed by the university as a probationary lecturer, I have been assigned as a supervisor for some of UCSC examinations (see Appendix B) and BIT examinations. It was not a difficult task for me, because I have been already exposed to similar environments. However, the responsibility is higher than invigilation. Among the tasks as a supervisor:

- Take stationary and documents before the examination
• Take the paper bundles and handle them carefully and securely
• Make sure that the examination is in good condition to conduct the examination
• Verify the invigilators and assign tasks for each of them
• Put directions for students
• Admit the students on time
• Make necessary announcements to students
• Open the paper bundles in front of students (after taking signatures of two students)
• Distribute papers on time with the help of invigilators
• Handle any unauthorized candidates and examination offences
• Finally, bundle the answer sheets, seal them properly and return them to the examination department or to an authorized person

So far I have experience in supervising examinations that had around 250 students with around 12 invigilators. These big examinations are bit hard to supervise, because it takes considerable time to walk around the hall and to synchronize the tasks.

10.5. Coordination of BIT (External Degree) Final Year Projects

On the first day I assumed the duties as a probationary lecturer I went to see one of the academic coordinators to inform him about my new post and to ask him what else I should do in addition to submitting the duty assuming letter. From the first glance I felt that he was expecting me. First he asked about my current workload and then asked me whether I like to take the responsibility of coordinating the BIT final year projects module. He also told me that so far most other persons who had coordinated this module have failed to do it properly. I knew that it is not an easy module to be coordinated. However, I did not have other option than saying “ok”, because I could not justify that I already have a big workload. Since this is the first duty I received after I assumed the duties in the new post, I tried to consider as a challenge to do it properly.

As the coordinator I have identified the following tasks:
• Give necessary instructions to the BIT office and communicate with them in the process of registering students for the final year project

• Organize a seminar on project during the 2nd month after the registration. For the seminar I have to find speakers from senior academic staff and arrange other things like a hall, helping personal, refreshments, etc.

• At the end of project period the evaluation starts. For that I have to schedule the evaluations after informing the academic staff. In addition, I have to find resource persons to support examiners and the process, arrange refreshments, solve whatever conflicts happening on the day, etc.

• Later, I have to process the results with the help of BIT coordinator and release them appropriately

From the last year’s experience, I realized that the task is not easy as I thought. The evaluation process lasts for more than 3 months. I have made several mistakes when scheduling the students and processing results. To overcome those I have to reschedule some sessions more than once. Anyway, the BIT coordinator gave me an enormous help in that effort. Otherwise, I have been totally lost in my effort.

However, this year I have approached the challenge differently while taking measures for the mistakes. Last year I could not start the project seminar on time, because it took unexpected time to register students at the entrance. However, this year I paralleled the process and simplified the registration. As a result I was able to preserve the schedule and do it smoothly. But still I saw that the productivity is not satisfactory enough. Therefore, next year I will be able to give solutions to that aspect as well.

10.6. Reflections and Commitments to SEDA

This chapter has discussed my commitments towards academic administrative duties. I have been coordinated many course modules and facilities, like, laboratories. This is diversifying my work without limiting to teaching related activities. Therefore,

✓ Working effectively with diversity and promoting inclusively (SEDA value)
I did not come to this point in a fruitful path; I had to face lot of difficulties. I was doing lot of mistakes and I have been suffering their consequences. But, I never step back from such duties.

I have been introducing many improvements to the system, such as, ways of registering users to laboratories (section 10.2), minuting meetings (10.3.1), etc. after seeing that the existing processes are not efficient. Sometimes, I am a deliberative decision maker, for instance, on the day of evaluations of BIT final year projects I am the one who decides how it should happen, and even when I am the supervisor of an examination I am the one who take the decisions. However, I have never been misused my authority and I was deciding what is correct and what is appropriate under university system.

My ultimate goal of administration is to develop the university system and people and make those processes more efficient. For instance, my coordination effort of robotics laboratory is towards helping the students in their learning.

This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

- **identify** your own professional development goals, directions or priorities (SEDA outcome)
- **plan** for your initial and/or continuing professional development (SEDA outcome)
- **undertake** appropriate development activities (SEDA outcome)
- **review** your development and your practice, and the relations between them (SEDA outcome)
- **inform** your professional role with relevant strategy, policy and quality considerations (SEDA outcome)
- Scholarship, professionalism and ethical practice (SEDA value)
- Continued reflection on professional practice (SEDA value)
- An understanding of how people learn (SEDA value)

As it has mentioned in section 10.3, I was trying to improve the efficiency of meetings held for discuss the issues of the course module ICT 2012 (see the section 7.8 as well).

- **extend** your use of learning, teaching and assessment approaches (SEDA outcome)
✓ **contribute** to the process of module/program design, implementation and evaluation (SEDA outcome)

✓ **provide** support to students on academic/pastoral issues (SEDA outcome)

✓ The development both of people and educational processes and systems (SEDA value)

My primary objective of coordinating industry relationships (section 10.1 above) was to develop a learning community between the university and industry. As a result, our students got several industry projects to implement.

✓ Working in and developing learning communities (SEDA value)
Chapter 11. Research and National Development

After deliberately reading this section the reader will be able to (but not limiting to),

- Recognize the value of working effectively with diversity, and working in and developing learning communities
- Describe author’s contributions to research
- Identify author’s continued development in research
- Recognize the author’s national obligations
- Describe author’s contributions to national development
- Evaluate commitments and achievements of SEDA outcomes and values

11.1. Introductory Remarks

This chapter discusses my commitments towards research and national development. As I have mentioned in chapter 2, I had a great desire to become a scientist and to do research since my school ages. My university education has enabled me to fulfill this desire to some extent through my final year individual project. But later on, it had become my responsibility to maintain my research culture.

Our country has invested lot on us by giving us a free education until our bachelor’s degree with the hope that we will contribute to the development of the country later on. Responding to their hope I have remained in academic to share my knowledge with the future generations, even though there are more opportunities in the industry for higher salaries. But, I realized that this is not enough. We as intellectuals, who representing a higher layer in the country, should try to influence the development of the country as well.

These two are even apparent in the university’s vision statement as well and it differentiates state universities from other private degree awarding institutes. Even from schemes of recruitment/promotion for associate professor/professor, it is apparent that more marks are
allocated for research and creative work, and dissemination of knowledge and contribution to university and national development, in addition to teaching related work (refer commission circular number 869 of university grants commission of Sri Lanka).

This chapter elaborates my contributions towards these objectives. At the end of this chapter there is a discussion to reflect my achievements of SEDA outcomes and commitments to SEDA values.

11.2. My Undergraduate Research Project

It was in 2002, when I was in my industry internship for three months, the coordinator of final year individual project informed us that we have to send a project proposal before some date. As soon as I got this request, I started to think about a project. So far I did not have any exposure to research. I thought it is good if I can do a project by combining my electronics knowledge and computing knowledge. At the mean time more and more ideas came to my mind and finally I prepared a list of project ideas and sent it to the coordinator for his advice. He then informed me that even though some ideas are good, it is very difficult to find relevant supervisors. Finally, I agreed to some idea which was given by him.

First, I was little bit reluctant to accept the idea as mine. But later I have improved it and changed the application area. Therefore, with the time I made it unique for myself while making the persons who gave me the initial idea as my supervisors.

I had two supervisors for my project and an examiner. The examiner was not visible for me until the final evaluations. But the supervisors were always monitoring the progress of my project. Sometimes their suggestions are stupid in the sense that they are either not relevant for what I was doing or they cannot be implemented.

At the same period, some team of researchers from OASIS of Sweden came to our institute and presented their work. It was about ebXML framework, which is a collection of specifications that together enable a modular electronic business framework. The vision of ebXML is to enable a global electronic marketplace where enterprises of any size and in any geographical location can meet and conduct business with each other through the exchange of
XML based messages (from web definitions). I received a training of one week and finally I have been appointed as a member of ebXML security team. In addition, I have been asked to see how my final year project can be integrated to that framework. As a result, I have spent more than a month to explore the literature to do something to fulfill this objective. However, later I got to know that the relationship has been discontinued between that OASIS team and UCSC. My efforts have been wasted, but that exposure was very much useful for my future career.

Gradually I got matured with research. I could differentiate a research project and an implementation project. My project was an attempt to answer the following research question:

Today email has become the widely accepted form of communication. However, it cannot be used as an official form of communication, like snail mail, because it is has the issue of repudiation: after an email transaction between a sender and a recipient, there is no proof that the sender has actually sent the email or the recipient has observed the email. Nowadays, there are email programs that can misuse someone else’s email address and send emails as it has been sent by that innocent person with that person’s knowledge. On other hand, the sender cannot verify that the email he/she has sent had actually reached the intended recipient and that person has observed it as well. My solution would help both of these parties by enriching current email framework with non-repudiation. It also integrates more feathers those are not possible with current email system, such as, scheduled emails, if A has not observed the email then forward it to B etc.

After an extremely hard effort, I could answer this question. I could implement the solution as well and it worked for both web mail systems and email client programs. However, there was a small problem, some email programs filters some code which I have included into the emails. I could not find a complete solution for this.

I have faced the project defense well and received a high rank for it. I was able to publish a research paper in one of international conferences as well (see the section 11.7). My dissertation and my implemented project are available in my website given below:

http://www.geocities.com/hekanayake/research.htm
11.3. Development of Electronic Money Order System for Sri Lanka Postal Department

I had a great desire to contribute to a project which has national and social impact. Realizing this dream, the supervisor of my undergraduate final year project and then my friend Mr. Rasika Dayarathna invited me to join as a research assistant of the project for developing an electronic money order (emo) system for Sri Lanka Postal Department, which is another innovative pilot initiative within the framework of the e-Sri Lanka programme being implemented by the ICT Agency of Sri Lanka (ICTA). The work has been done under the supervision of Prof. V.K. Samaranayake and some other academic involvement.

Initially, there were one another research assistant in addition to me, but as he left the project I had to intensify my support. As a result, in a short period of time we implemented the solution and we recorded success in registering BIT and M.Sc. candidates after doing payments using electronic money orders. The figure 19 shows the process of electronic money order transaction.

Figure 19: Electronic money order transaction
In April, 2004 we officially launched the project. The following pictures (figure 20) were taken on the day of the inauguration ceremony.

Figure 20: Some photos taken at the inauguration ceremony of emo
When I was writing this section of portfolio, our former director of UCSC and the chairman of ICT Agency of Sri Lanka Vidya Jyothi Prof. V.K. Samaranayake has passed away (on 7th of June, 2007). However, the work I have done under his influence will never pass away from my memories.

It was seen that some of the employees of Sri Lanka Postal Department are either resistive to improve their processes under the influence of information and communication technology. As a result, there was no continuation of issuing electronic money orders after we have handed over the infrastructure to them.

11.4. Registering for an M.Phil

In 2003, while I was finishing my B.Sc., I got to know that UCSC is advertising M.Phil positions in some selected areas. When I go through the list of areas, I realized that there is no any area that fulfills my needs. However, I was attracted to one area, the multimedia databases. I met the coordinator of that research area and expressed my intensions. He then provided me some documents and asked me to identify a research problem and construct a research proposal.

I did not have a clear idea of how to write a good research proposal when I was writing my first proposal for my M.Phil. My supervisor, Dr. Damith Karunarathna, advised me how to write it in an attractive way.

Although, I initially planned to do my M.Phil in the area of multimedia databases, while I was reading I realized that it is not the area I was looking for. I wanted to address the semantic information in such databases. But still, I did not know how to isolate my research problem. Yet I did not get informed about my selection for the M.Phil programme.

Later, in 2004, step-by-step I approached to the area I was looking for, which is Cognitive Modeling. No one in our institute knew about that area. Meanwhile, I was informed about the selection for the M.Phil programme and I was asked to pay the tuition fee. At the time, the National Science Foundation (NSF) of Sri Lanka had advertised research scholarships scheme and my supervisor advised me to write another proposal to get funding support to my M.Phil.
At the time, I had a clear picture of what I am going to do. So, I wrote my second research proposal and eventually my application got selected. They awarded me a research scholarship (see Appendix B).

With the support of NSF, I got registered for the M.Phil effective from 15th of October, 2005. Initially, my registration was on part-time basis, and to cater that I had to resign from all my temporary academic posts. However, effective from 1st of February, 2006 I have been absorbed as a probationary lecturer, and I had to convert my M.Phil registration to part-time basis. Since then I am continuing my research. I have been informed to send progress reports at the end of every 6 months both to UCSC and NSF.

### 11.5. Supervising Undergraduate Research Projects

I had the opportunity of coordinating undergraduate 4th year individual project course module for more than two years (see 10.1). There I gained the experience of how others supervise project and how the entire process is happening. I was the one who decided the evaluation criteria with the help of former coordinators. I got to know what should be achieved by students under their project.

With this experience I started supervising the first research project two years ago. The student who took that challenge collaborated with me and as a result he ended up with good achievements (see 4.4). After that in the next year more students came to me asking for project ideas and to supervise their project work. At the end I had to supervise four research projects and it was contrast that out of 13 of the batch 4 students are supervising by me.

The current coordinator has decided to have the following components for the module:

- Project proposal and proposal defense
- Interim report
- Final report draft
- Project defense
- Final report (dissertation)
The students have submitted project proposals with my guidance and faced the proposal defense as well. In the proposal defense I had to support some students because they failed to convince the idea well to the examination panel. During the period I always tried to be available to my students to discuss their matters. I saw that they are trying to scope down their initial objectives, but I did not allow them to do so unless there are unavoidable circumstances and this has been justified.

I always gave comments and suggestions to improve their report writing. I showed them sample reports. There was no interim defense scheduled for the evaluation criteria. Therefore, I decided to schedule a one only for my students. After doing so I saw that it really helped the students to identify their weaknesses and what else they should do to improve their work.

At one instance, few students came to me and explained their difficulty of solving some problem because there were no some devices in the laboratory. First, I tried to verify that it is true in the sense that there is no other option as such. Then, I discussed this issue with a senior staff member and he suggested the way of purchasing the devices. Following him, first I did a market study and identified some vendors. Then I wrote a letter to the directory through the head of the department explaining the need and the options we have if we were to buy those devises. I think because of the focused nature of the process, I was able to purchase those devices from a foreign vendor in a very short period of time and help the students to continue their work without much interruption. This has been discussed under my Learning Agreement Number 12.

Final defense held recently and surprisingly and comparatively my students were very much successful in their work. But at the same time I saw that they are facing difficulties in convincing their contribution well to the audience. In addition I saw some weaknesses of me as well. I have failed to support the students when they get stuck at the defense and I did not advise them with some aspects prior to the defense. These areas I should improve for the next batch.
11.6. Supervising Research Seminar Presentations and Reviews

Seminar presentation is a new course module introduced to the 4th year curriculum since this year. In that each student is required to present and lead to a discussion on a recent research paper under the supervision of an academic staff. In addition, each student have to write short reviews for two other research papers and write a research paper for their own research project.

Since I am already supervising some research projects (see 11.4) those students came to me asking for research papers. In addition, they also presented me some papers they had located for their research projects. After carefully analyzing the papers I have recommended them some papers and it led to successful presentations and discussions by them. In addition, I have marked some reviews submitted by the students and they were also in a good standard.

This total effort was not contributing to my official academic workload. I contributed to it for the following outcomes:

- We did not have a similar component when we were at undergraduate. So, I do not know whether I am good in defending or analyzing ideas. This research seminar helps me to fill that missing skills
- On the other hand, the whole thing is about research. I was happened to read several research papers and update my knowledge on those areas
- I was able to learn things from other’s mistakes. When students are presenting I saw the mistakes doing by them. Eventually, on reflection I got to know what mistakes I might be doing and what I have to improve (see 8.5)

11.7. Publishing My Research Work

My first research publication had arisen from my undergraduate final year project. At the time, I did not know the purpose of a research paper and how one should publish it. My supervisor Mr. Rasika Dayarathna first asked me to write a paper and I wrote a minimal paper. Then he improved it with the help of the examiner Dr. Kasun De Zoysa. After
completion they had submitted it to the International Information Technology Conference (IITC) 2003. Surprisingly, it got selected to publish under the proceedings. Later, Dr. Kasun presented the paper at the conference and it got published. After I saw the process, I swore to myself that in coming years I will do more publications on my own.

Realizing my own declaration, I was able to publish my second research paper at IITC 2005. This had arisen from one of my own research and it was a one man’s show. At the same time, I reflected to myself that I should try to get involvement of more researchers to my publications, because sometime it is not appropriate to do academic publications as a single entity (see NCAS workshop).

In the succeeding year (i.e. 2006) I could intensify my publications and did five publications for the year. Three were arisen from my own research activities and two were from the first undergraduate project I supervised. I was so happy that the student’s paper was awarded the Prof. V.K. Samaranayake Prize of the best paper presented at International Information Technology Conference (IITC) 2006. In addition, a cash prize of Rs. 20,000/= was presented for the authors. This is the last time Prof. V.K. Samaranayake awarded the prize, which is named on his honor, from his own hands as he has passed away before the next IITC conference. Two publications I did in 2006 were in favor of my M.Phil research and one of them is a journal paper.

My next intension is to do more international level publications. In addition, I have some desire to contribute to local journals as well, for instance the journal which is managed by the National Science Foundation of Sri Lanka. One another aspect I should improve is my writing skills and I am now taking measurements to improve it. The next major issue is addressing ethical issues. I have seen and I have experienced misconducts in academic publications, because academics are in eager to expand their publication banks to apply for promotions. I am always trying to publish genuine work. I will continue this practice for the future and in the mean time I will not hesitate to change my attitudes if someone pointed me some wrong conduct of me.

A complete list of the publications I have contributed so far is listed under the chapter 1.
11.8. Writing Newspaper Articles

UCSC has recently initiated a section in a weekend newspaper called “Dinamina” dedicated for computer related knowledge. The objective is to disseminate the latest knowledge in the area to the public using their native language. The work is totally voluntary.

I was invited to provide some articles to the paper, but initially I did not have any vision regarding my writings for the paper. However, later I thought I can use this opportunity to disseminate the knowledge on one of my area, which is robotics, to the public. My plan is to teach them how to build an own robot for everyone using the things you can find from local shops. I have to be very careful when I am writing, because the target readers are just school students. I have written more than 20 articles so far since I started this effort and some of them are attached here in the Appendix B.

11.9. My Websites on World Wide Web

Since I was an undergraduate, I had a desire to create a personal website for myself. Following that desire, I have experimented creating some websites. However, there were no that much of information posted on those sites (visit http://www.geocities.com/hiran78/).

However, in 2005, I put an effort to create a professional level website by posting my current work up to that point of time, which is available at http://www.geocities.com/hekanayake/. The idea was to share my work including research with the public. Now, I am developing another website at http://ucsc.cmb.ac.lk/People/hbe/ to further enrich my public appearance. So far I have received feedback from my colleagues, students and general public. It is happy to mention that some of my students also have followed my path and they also have created websites posting their work.

11.10. What Else

If I compare my current achievements towards research and national development with my status around three years back, I have made a big progress. However, I am expecting to go beyond my current in next three years. For that I have the following items in my agenda:
- Cultivate more research mindsets in my institute by converting more and more students into research culture
- Support for more research projects
- Contribute to national level projects
- Support for more newspaper articles
- Publish more journal papers
- Write some books to disseminate knowledge to the public
- Do inventions

11.11. Reflections and Commitments to SEDA

This chapter has described my commitments towards research and national development. The chapter 2 has described how I was trying to gain skills on doing research by doing various experiments. However, they were not focused research. In addition, I did not know how to plan a research or publish the findings after getting results.

Things changed after my exposure to research as a result of my final year individual project. I was exposed to semi-research environment and received my first training on research. It helped me to learn the following aspects:
- Write a research proposal
- Work under a supervisor
- Do a literature review
- Formulate a research problem and present the results
- Write a project report
- Face the defense
- Publish a research paper

Later I registered for an M.Phil. and it helped me to improve my research knowledge. This time, I have received additional experience on applying for a research grant by writing a proposal for the NSF.

The reflections in research have helped me to share the same knowledge with my students. This time I have become the supervisor and I tried to facilitate and guide them in doing their
research. I tried my best to avoid those mistakes done by my supervisors. But I know that there are some mistakes which have happened by me and I am trying to avoid them next time. However, some of my students have achieved well in their work and some of them were able to publish their work in international conferences as well.

The second focus of this chapter is national development. I have discussed one project where I had contributed to develop an electronic money order system. I am still worrying about the final result of it. Even though, we have implemented it well, we failed to guarantee its sustainability. I have voluntarily contributed some months even after the agreement has over with UCSC to keep the system running. However, after I saw lack of commitment from other parties, I tried to step back. So, the lesson I learnt is, it is not only the technical knowledge you need when to contribute to a national project, but also you need other skills like management skills, communication skills, etc.

Finally, I try to share my knowledge with the general public and students in various forms. In addition to lecturing, I am publishing research papers to conferences, maintaining websites, write newspaper articles, etc. In addition I have more expectations to improve my dissemination of knowledge to the public.

This chapter therefore demonstrates my reflective practice according to the Kolb Learning Cycle with the following:

- **identify** your own professional development goals, directions or priorities (SEDA outcome)
- **plan** for your initial and/or continuing professional development priorities (SEDA outcome)
- **undertake** appropriate development activities priorities (SEDA outcome)
- **review** your development and your practice, and the relations between them priorities (SEDA outcome)
- Continued reflection on professional practice (SEDA value)
- Working effectively with diversity and promoting inclusively (SEDA value)

Teachers from the academic perspective should also contribute to research as I am demonstrating throughout the chapter. This updates their knowledge and then enables to share (disseminate) that knowledge with their students and others (section 11.1 above).
✓ use a variety of methods for evaluating your teaching role (SEDA outcome)
✓ inform your professional role with relevant strategy, policy and quality considerations (SEDA value)
✓ The development both of people and educational processes and systems (SEDA value)

My expertise on specific areas as a result of research has helped me to contribute to design the course SCS 4013, which has discussed in chapters 4 and 5.

✓ contribute to the process of module/program design, implementation and evaluation (SEDA outcome)
✓ The development both of people and educational processes and systems (SEDA value)

I have helped the students whenever they get stuck in their work, for instance, resolving a resource problem (see 11.5 above)

✓ provide support to students on academic/pastoral issues (SEDA outcome)

When it comes to project supervision, it is essential to know how the students are developing with the concepts (section 11.5 above). When it comes to disseminate knowledge to the public, I am writing the newspaper articles in their native language, otherwise I will lose the majority (section 11.8 above).

✓ An understanding of how people learn (SEDA value)
✓ Working in and developing learning communities (SEDA value)

Research is very sensitive for academics because it determines their sustainability, for example, number of publications they have. Although, I am knowledgeable of inappropriate activities in concern to these publications, I am trying my best to keep my integrity intact (section 11.7 above). In concern to nation development also some people work towards their income. However, my satisfaction is through the actual work (section 11.3 above).

✓ Scholarship, professionalism and ethical practice (SEDA value)
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“If a practical end must be assigned to university courses, I say that it is that of training good members of society. A university degree is the great ordinary means, to a great but ordinary end. It aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste, at giving enlargement and sobriety to the ideas of the age, at facilitating the exercise of political power, at refining the intercourse of private life. It is education which gives a man a clear conscious view of his own opinions and judgments, a truth in developing them, an eloquence in expressing them, and a force in urging them. It prepares him to fill any post with credit, and to master any subject with facility. It shows him how to accommodate himself to others, how to throw himself into their state of mind, how to bring before them his own, how to influence them, how to come to an understanding with them, how to “bear” with them. He is at home in any society, he has common ground with every class; he knows when to speak and when to be silent, he is able to converse, he is able to listen”

(source CTHE course notes)
Appendix A – Learning Agreements

- Learning Agreement Number 01: Course Design/Teaching
- Learning Agreement Number 02: Assessment
- Learning Agreement Number 03: Making Learning Active
- Learning Agreement Number 04: Student Feedback
- Learning Agreement Number 05: Time Management
- Learning Agreement Number 06: Peer Feedback
- Learning Agreement Number 07: Active Learning/ Teaching
- Learning Agreement Number 08: Teaching Small Groups
- Learning Agreement Number 09: Lecture Evaluation
- Learning Agreement Number 10: Coordination Evaluation
- Learning Agreement Number 11: Time Management
- Learning Agreement Number 12: Focused Writing
- Learning Agreement Number 13: Assessing Labs and Practicals
- Learning Agreement Number 14: Setting Exam Questions
- Learning Agreement Number 15: Marking Report Sheets
Learning Agreement Number 01: Course Design/Teaching

5 sides
Learning Agreement Number 02: Assessment

5 pages
Learning Agreement Number 03: Making Learning Active

6 sides
Learning Agreement Number 04: Student Feedback

4 sides
Learning Agreement Number 05: Time Management

4 sides
Learning Agreement Number 06: Peer Feedback

3 sides
Learning Agreement Number 07: Active Learning/Teaching

3 sides
Learning Agreement Number 08: Teaching Small Groups

3 sides
Learning Agreement Number 09: Lecture Evaluation

4 sides
Learning Agreement Number 10: Coordination Evaluation

4 sides
Learning Agreement Number 11: Time Management

3 sides
Learning Agreement Number 12: Focused Writing

3 sides
Learning Agreement Number 13: Assessing Labs and Practicals

10 sides
Learning Agreement Number 14: Setting Exam Questions

6 sides
Learning Agreement Number 15: Marking Report Sheets

4 sides
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B 4. Certificate of Carrier & Personality Development Programme

1 side
B 5. Certification of participation for the TECS Week 2006
B 6. Course handbook of SCS 4013

6 sides
B 7. Sample supplementary note set of SCS 4013

12 sides
B 8. Sample laboratory practical scripts of SCS 4013

10 sides
B 9. Assignment sheet of SCS 4013

5 sides
B 10. Poster evaluation sheet of SCS 4013

1 side
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1 side
B 12. Sample minutes of meeting sheet of ICT 2012

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2 sides
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2 sides
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2 sides
B 19. Sample newspaper articles of Dinamina paper

2 sides
B 20. "Swara Rashmi" CD cover

1 side