Use of Data Quality Index in Student Feedback for Quality Assurance of Engineering Programmes at the Military Technological College, Muscat, Oman

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Abstract

This case study was undertaken to assess the effectiveness of the modifications into the engineering programmes adopted by the Military Technological College (MTC) to satisfy the needs of Omani armed forces. It discusses the role of Quality Assurance (QA) in engineering education and accreditation process in the context of four engineering programmes offered by the MTC. The study outlines the steps undertaken by the QA department at the MTC which are practiced by western institutes and universities. This study also included the student feedback as the most important parameter in measuring the effectiveness of modified engineering programmes. Due to low participation rate, the data quality index (DQI) approach was used for assessing the quality of the programme in a military learning environment. The MTC applied its anonymous over sighting the engineering programmes offered by the four engineering departments (Aeronautical, Civil, Marine, and Systems). The Student Evaluation Questionnaire (SEQ) used in the academic years 2014-15 and 2015-16 was modified and the improved version was used in academic year 2016-17. In year 2016-17 a total of 561 students participated online in the SEQ survey. The student's satisfaction about the module and lecturer with low participation rate was above 50% in most modules which could be misleading. However, after transformation of the data to DQI the student feedback became more representative. On a scale of 0 – 100, a lower DQI value indicated higher student satisfaction. The DQI can be used as an institutional approach for maximum information and assessment of module performance. Out of 43 modules, the students were more satisfied in module MTCA5030 owned and managed by Aeronautical Engineering Dept.; in module MTCC3009 (section 2) owned and managed by Civil Engineering Dept.; in module MTCM5004 owned and managed by Marine Engineering Dept.; and in module MTCS5011 owned and managed by Systems Engineering Dept.

Keywords: quality assurance, engineering programmes, military college, training need analysis

1. Introduction

The engineering pedagogy continues in all disciplines due to rapid globalisation. In the past years, the questions were raised regarding the qualification of graduates at technical institutes of higher education (Gabriel, 2004). The mobility of engineering graduates nationally and internationally is another reason to enhance quality and standards by introducing QA and professional accreditation processes (Harun et al., 2013; Becker, 2006). The noticeable changes in the social, economic, industrial, and environmental sector in the Omani society along with the revolution in information and communication systems, and the rapid technological changes have generated the need for establishing an engineering and technological college. In this context, the Ministry of Defense (MoD), Oman, decided to set up the Military Technological College (the MTC) in Muscat, for training of the students/graduates who would serve the armed forces of the Oman.

The MTC among other organisations, has developed a Quality Assurance (QA) Department that is tasked with over sighting the engineering programmes offered by the four engineering departments (Aeronautical, Civil, Marine, and Systems) to satisfy the needs of the clients. The series of quality standards published by the International

Organisation for Standardisation (ISO) could be applied to technical institutes with modified terminology. These standards could be bench marked for quality audits of the programmes and enhanced reputation of the institute (Walsh, Ralph & Raymond, 1986; McDermott, Andrew & Ozdemir, 2004). The accreditation methods used by professional accreditation bodies are well respected by the engineering institutes for the accreditation of engineering education (Becker, 2006).

The published research has confirmed that student feedback is the most important parameter in measuring the effectiveness of engineering education and other aspects of learning environment (Chenicheri, Arun, & Patricie, 2011; Fraser, 1998; and Ramsden, 2005). There is a strong correlation between learning and teaching environment and level of student's overall satisfaction (Nair & Fisher, 2001). Therefore, student feedback has become a measuring tool for assurance of quality in higher education and is equally applicable to engineering programmes (Harvey, 2003). In military technological college environment, this measure of teaching effectiveness can be used in administrative decision making, for instance academic advising on selection of TNA courses/subjects; and how the contents of TNA subjects could be improved. Thus, student feedback in engineering programmes (coupled with TNA competency based courses) may help improve lecture and laboratory facilities (Patil & Codner, 2008). The student feedback in a military technological college can also be useful for making decisions on readiness of graduates for work. A similar concept is presented by Martin et al., (Martin, Brian, Jennifer, & Duncan, 2005).

This paper outlines the steps undertaken by the QA department at the MTC which are practiced by western institutes and universities. Some practices are applied with some minor modification to suit the Omani culture, military requirements, and local engineering education system. The objective of this paper is to (i) assess the effectiveness of the modifications into the engineering programmes adopted by the Military Technological College (MTC); (ii) discuss four key areas for measuring the effectiveness of the programme namely: programme monitoring; the effectiveness and currency of the curriculum; learning and teaching strategy; and student feedback; and (iii) discuss the role of QA in engineering education and accreditation process in the context of four engineering programmes especially designed and offered by MTC.

2. Methodology/Approach

Academic quality is a way of describing how well the learning opportunities available to students help them achieve their award. The MTC applied its anonymous over sighting the engineering programmes offered by the four engineering departments (Aeronautical, Civil, Marine, and Systems) to satisfy the needs of the clients.

The MTC has established a QA Department that was tasked with the audit of academic quality that was completed by student feedback collected through a Student Evaluation Questionnaire (SEQ) in areas like overall effectiveness; effectiveness of delivery; effectiveness of personal tutoring; effectiveness of student staff consultation; and awareness of career path. The SEQ was developed by the QA department in consultation with the faculty of four engineering departments and representatives of the training need analysis department that liaise with MoD. The quality standards are applied with some minor modification to suit the Omani culture, military requirements, and local engineering education system.

The SEQ used in academic years 2014-15 and 2015-16 was made up of seven questions. The student's answers were converted to numerical scale 1-5 as shown below.

1	2	3	4	5
Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree

In academic year 2016-17, the SEQ was modified by putting three questions about the module, and five questions about the lecturer. Before administration of the SEQ, students were advised by email, during military activities, and in-class announcements of the survey and its importance. A total of 561 students participated (N=561) in the SEQ survey.

2.1 OAAA Qualifications Framework

The Oman Standard Classification of Education Framework (OSCED) is a framework designed to organise the entire scope of topics that could be studied in programs of education, with emphasis in the first instance on higher education. Classification of education frameworks are used worldwide to serve as "an instrument suitable for assembling, compiling and presenting statistics of education, both within individual countries and internationally" (UNESCO/OECD, 2005). Oman is a member of Organisation for Economic Co-operation and Development (OECD). There are many specific potential applications for OSCED. The Oman Quality Framework (OQF) defines the levels and types of academic qualifications in postsecondary education. The OSCED defines the broad, narrow and detailed

fields of study. This framework shown in Figure 1 sets standards that define and differentiate between different types of higher education providers (e.g. colleges and universities).

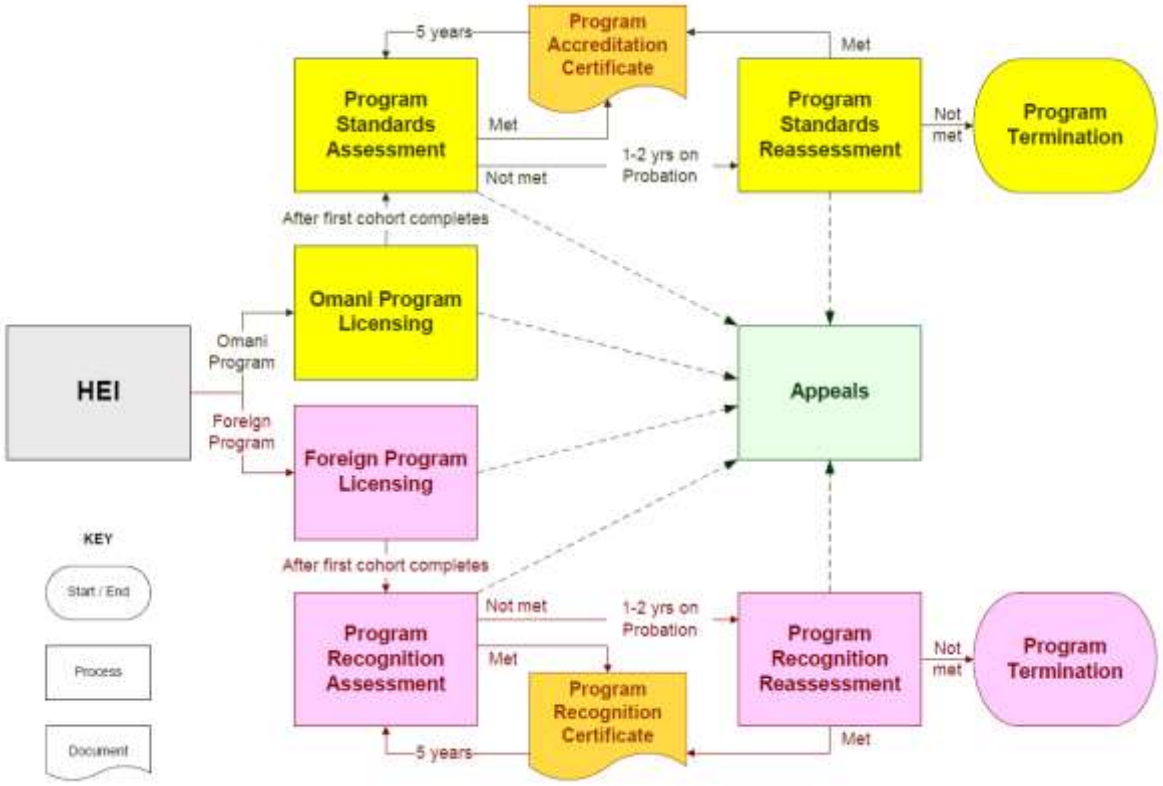

Figure 1. Programme quality assurance framework.

3. Objectives of MTC Engineering Programmes

The engineering programme is structured as per training needs analysis (TNA) requirement with stage one competency standards (Engineers Australia, 2011). The main three areas of the competencies include knowledge and skills; engineering application ability; and professional and personal attributes. When the graduates are trained to serve the armed forces, the development of life-long skills are required in the course of solving engineering problems. Hence, the engineering programmes are based on engineering design; multi-disciplinary team projects; TNA modules for acquiring professional skills through personalised mentoring; and workshop practices.

3.1 The MTC's Customers

As mentioned above, the main three forces, Royal Oman Army (ROA); Royal Air Force of Oman (RAFO); and Royal Navy of Oman (RNO) are the MTC's customers. In order to meet the needs of each service, the B. Eng. (Hons.) programme incorporates the pathways to meet the objectives of the competencies of the MoD. The Aeronautical Engineering programme is designed for two pathways (Avionic, and Mechanical); Civil Engineering is for three (Quantity Surveying, Construction Engineering Management, and Civil Engineering); Marine Engineering is for six pathways (Hull Engineering, Control Engineering, Radio/Radar Communication, Electrical Engineering, Mechanical Engineering, and Defense Systems); and Systems Engineering for eight pathways (Mechatronic Engineering, Computer Engineering, Communication Systems Engineering, Electrical/Electronic Engineering, Mechanical Power Engineering, Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) Engineering, Vehicle Engineering, and Ground Communication Radar Engineering). The details of TNA and the integration of engineering and TNA courses are reported by Khan and Al Zubaidy (Khan and Al Zubaidy, 2016a; Khan, Boretti, & Al Zubaidy, 2016b).

3.2 Quality Assurance at the MTC

The guideline for QA framework is derived from University of Portsmouth (UoP), United Kingdom (UK) (under collaborative partnership) programme review documents. The MTC adopts and pursues an explicitly academic-led approach to QA, reflecting the college recognition that the active and critical engagement of its academic staff is central to the fulfillment of its mission. The key processes which comprise the QA framework are as follows:

- Five-yearly department review
- Annual monitoring
- Five-yearly programme review
- Teaching and learning strategies
- Programme specifications
- Student evaluation questionnaires
- External examiners
- Teaching observation and evaluation
- The department steering committee with board of studies responsibilities.

These processes foster and embed a quality culture within the college, which encourages staff and students to engage meaningfully with issues relating to QA and enhancement (Khan and Al Zubaidy, 2016a).

3.3 Student's Skills Assessment

The academic performance in engineering modules during first and second year B. Eng. Programme was assessed through formative and summative assessment, whereas the skills assessment of TNA competencies was based on log book entries of laboratories and workshop sessions conducted by students for TNA modules which are verified by the module coordinators.

It should be noted that student's skills assessment measured by log books might affect the investigation in some cases where students may underestimate or overestimate their achievement of TNA competencies. However, the sample size (N) of three cohorts, ranging from 167 to 242, is sufficient to draw conclusions on QA analysis of the programme based on TNA assessment. The analysis of two academic years' student performance (2014-15 & 2015-16) suggests that student performed well and the governance of the programme through QA regulations and process witnessed the effectiveness of the engineering programme in a new military learning environment (Khan and Al Zubaidy, 2016b).

3.4 Examples of Student's Work

One sample student's work for a University of Portsmouth module (a core and Level 3 module) Introduction to Electrical Engineering, is shown in Appendix A. This course work artefact was submitted through Turnitin and was blind marked by two markers. The assignment pages with annotation are not shown in appendix A and only that part of Turnitin assignment is shown which is important in making assessment decisions. The originality of the student work is assessed by similarity index, use of internet sources, publications and student papers. The MTC policy on academic integrity is applied if plagiarism is detected and referred to an academic disciplinary committee. The student's work for TNA module (Engineering Workshop Practices), a non-UoP Level 3 module of Marine Engineering programme, is shown in Appendix B. The excerpts of Task book/Log book (4 pages out of 11) related to a TNA module of Marine Engineering programme called Royal Navy of Oman-Sultan bin Said Naval Base (RNO-SBSNB) attachment is shown in Appendix C. The two week attachment to aboard ship at a naval base is part of training under this TNA module.

4. Results and Reliability of SEQ Surveys

4.1 Programme Monitoring

The programme was monitored by analyzing i) student retention, ii) student progression, iii) student achievement, iv) external examiners' reports, v) student feedback, vi) report on annual review of standards and quality by University of Portsmouth, U.K, the partner university, vii) employability, viii) reports of accreditation bodies after two accreditation pre-visits, ix) staff development, and x) critical overview of the curriculum. Among these ten areas, the student feedback is analyzed more in depth by adopting the data quality index approach.

The student retention and progression rate among four engineering departments in academic years 2014-15 and 2015-16 ranged from 72-93%, and 72-92% respectively. Additionally, the programme was monitored through annual monitoring of core engineering modules including TNA modules. The criteria used are based on the review of i) feedback from staff and students, ii) feedback from external examiner, and iii) analysis of assessment results. The reviews and analysis suggest that the objectives of the programme were achieved as expected for the interim period (2014-15 to 2016-17). However, some issues identified by the module coordinators to be addressed were: i) changing of the teacher within the trimester; ii) level of challenge for some lab experiments; iii) inclusion of a form of summative assessment after trimester one; iv) overlap in teaching material of some modules; v) late arrival of lab equipment; and vi) delay in installation of MATLAB software on student's laptop. These issues were addressed and the changes recommended under (iii) has been submitted for approval.

4.2 Findings of Accreditation Panel

As part of the pre-accreditation process, members from six Professional Engineering Institutes (PEIs) namely the Institute of Mechanical Engineers (IMechE), the Institute of Engineering Technology (IET), the Royal Aeronautical Society (RAeS), the Institute of Civil Engineers (ICE), the Institute of Marine Engineers, Science and Technology (IMarEST) and the Energy Institute (EI) visited the College and reviewed the programmes being offered by the MTC. The PEIs panel has concluded that it would plan another visit before the end of 2018 as part of the full accreditation visit. In summary, the PEI panel has commended the investment in facilities and laboratories, investment in staff and their commitment to the project and the level of student support and approachability of the staff. The panel made further observations on the clarity provided on different pathways to students, future utilisation of laboratory facilities to underpin and achieve Accreditation of Higher Education Programmes (AHEP) outcomes, revision of output mapping to BEng programmes, and the active promotion of PEI membership to staff and students.

The key commendable findings of the PEI panel (Graham, 2015) after pre-accreditation visit were:

i) The superb workshop facilities which included modern, military equipment and state-of the-art training aids;

ii) The College's adoption of the 'Upside Down' approach to teaching and delivery;

iii) The clear use of Engineering Design as a 'thread' that runs through all of the programmes from Year 1 to Year 4;

iv) The Training Needs Analysis (TNA) work that has been carried out ensures that the programmes' syllabi closely match the customer's requirement;

v) The excellent staff student ratio and high proportion of Chartered Engineers on the staff; and

vi) The teaching of mathematics in an engineering context.

4.3 The Effectiveness and Currency of the Curriculum

The critical review of curriculum implementation carried out by QA dept. suggests that the curriculum is properly designed to achieve the engineering education in four disciplines. The intended learning outcomes of the first and second year modules are effective and current with respect to bench mark criteria set up by university of Portsmouth, U.K. The issues such as changes to the course structure of a module (engineering material and hardware) and changes to the assessment strategy for some modules, addressed on time contributed towards effectiveness of the curriculum.

4.5 Learning and Teaching Strategy

The learning and teaching strategy of the MTC is practiced for the following six aims:

i. to instill the general competencies, transferable skills in students; engage them in research and reward them for their academic excellence in order to attract and support high-caliber students

ii. to meet the requirements for professional registration, such as Chartered or Incorporated Engineer Level, in the Engineering Council UK

iii. to meet the requirement of Oman Armed Forces, including enhancing practical skills of students and their connections to academic activities

iv. to incorporate in the delivery of the five building blocks of the curriculum design and continuously enforce the central themes of safety and sustainability, transferable skills, management and entrepreneurship as described in the academic framework

v. to enhance the students' experience and ensure efficient operation of students' support system

vi. to provide environment for staff academic development and training, and to acknowledge and reward teaching excellence.

The measurement of the key performance indicators (KPIs) outlined in the MTC learning and teaching strategy indicated appropriate and acceptable data on students' pass rates, successful completion of design modules, registration of students as student member of professional engineering societies, benchmark staff membership level, students' retention and progression, students' satisfaction, usage of lab and workshop equipment, health and safety practices in the labs/workshops, level of participation and students' engagement with the services during the study period, and level of compliance with the TNA requirements of the forces.

4.6 Quality – Student Feedback

Academic quality defined by UNESCO (UNESCO/OECD, 2005) is as a way of describing how well the learning opportunities available to students help them achieve their award. The MTC continued its anonymous Student Evaluation Questionnaire (SEQ) at the end of trimester 2 and 3. The feedback was collected for all modules offered in 2014-15 and 2015016 covering the four engineering departments. The SEQ response to six key questions was analysed and the outcomes to the five measures for the end of trimester 2 survey was as follows (Al Zubaidy, 2015; Filip, 2016):

		Academic Year 2015-16	Academic Year 2014-15
1.	Overall effectiveness	59.9%	55.7%
2.	Effectiveness of delivery	64.1%	62.1%
3.	Effectiveness of personal tutoring	60.0%	58.1%
4.	Effectiveness of student staff consultation	48.6%	27.4%
5.	Awareness of career path	58.7%	39.1%

The survey results in trimester 3 of 2015-16 indicated a slight drop in the values for above mentioned five areas, and were measured as 56.4%, 60%, 55.1%, 50.1% and 53.3% respectively. It is noted that, compared to the academic years 2014-14 & 2015-16, all measures have shown improvement, with a marked difference from 27.4% to 48.6% in the measures relating to the effectiveness of student staff consultation. The measure of awareness of career path has also improved significantly in year 2016-17.

In academic year 2016-17, the college adopted collection of SEQ data online via Moodle. In this academic year (2016-17) the college discontinued the trimester system and adopted a semester system. The student satisfaction was measured for all modules by an improved version of the questionnaire consisting of the three questions about the module; and five questions about the lecturer shown in Appendix D.

The student feedback collected at the end of academic year 2016-17 was considered as unrealistic due to low participation rate of the students. The student feedback data is massively influential, but in reality is inadequate for assessment of quality if not standardised. To help staff understand the measurement of student satisfaction, the QA department adopted transformation of the data to data quality index (DQI).

Three to five modules from each of the four engineering departments were sampled for DQI. The list of sampled modules with modules titles owned by four engineering departments is presented in Table 1.

Table 1. List of sampled modules with module titles owned by four engineering depts.

Module code	Module title
MTCA3001	Engineering Mathematics-1
MTCC3009*	Engineering Practice
MTCA3011	Electrical Engineering Principles-1
MTCS4001*	Engineering Mathematics-2
MTCS4005	Computer Systems
MTCM4006	Thermal Systems Engineering-1
MTCC4014	Materials and Construction Technology Property
MTCC4018	Economics and Financial Accounting Aircraft
MTCA4028	Aerodynamics Principles Safety Engineering
MTCS5001	Management
MTCM5004	Thermal Systems Engineering-2
MTCA5009	Aircraft Structures and Mechanical Systems Vehicle
MTCS5011	Structural Systems
MTCA5030	Aircraft Electrical and Avionic Systems
MTCM4046	Ship Resistance and Propulsion
MTCM5049	Antennas and EM Wave Propagation

*has more than one section

Before using DQI, based on a scale of 1-5, the percentage score (%) of student satisfaction was calculated using the following formula for each question.

$$(\%) = \frac{(5\text{xA}) + (4\text{xB}) + (3\text{xC}) + (2\text{xD}) + (1\text{xE})}{(5\text{xP})}$$

Where A = number of responses under strongly agree

B = number of responses under agree

C = number of responses under slightly agree

D = number of responses under Disagree

E = number of responses under strongly disagree

P = number of participated students

Ideally the participation rate should be at least 50%. Under structural equation modeling (SEM) the data quality index is a function of score percent and participation rate (Ramsden, 2005) and quantify the variation in calculated weighted average satisfaction score (S_c) due to participation rate (P_r) (Banco de Mexico, 2014).

$$\text{DQI}\ (S_c, P_r) = S_c/P_r$$

The Figures 2 to 5 show students' satisfaction score and DQI for selected modules (see Table 1 for module codes and title of the modules) in four engineering departments for semester one of academic year 2016-17. It is clear from these figures that, the students' satisfaction about the module and lecturer with low participation rate is above 50% in most modules which could be misleading. However, after transformation of the data to DQI the student feedback becomes more representative. On a scale of 0 – 100, a lower DQI value indicate higher student satisfaction.

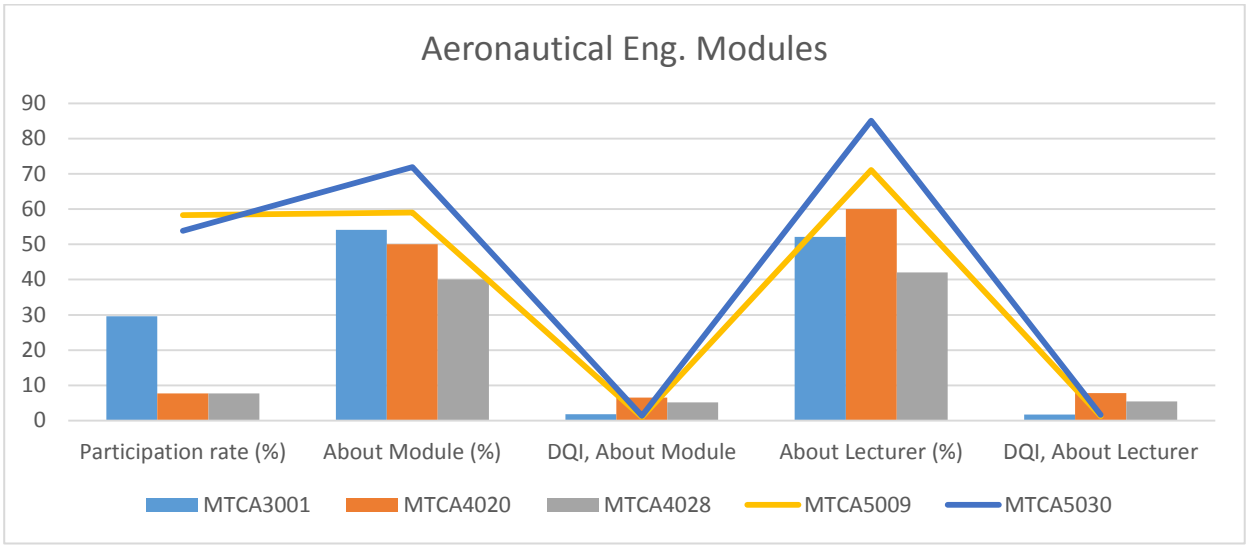

Figure 2. Student satisfaction score and DQI for Aeronautical Engineering Programme modules

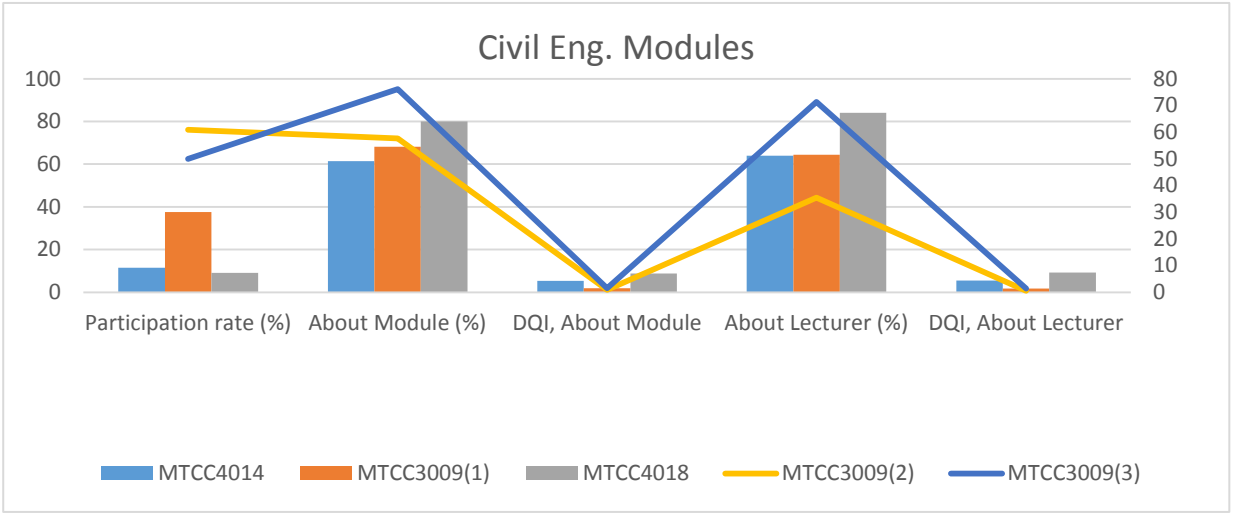

Figure 3. Student satisfaction score and DQI for Civil Engineering Programme modules

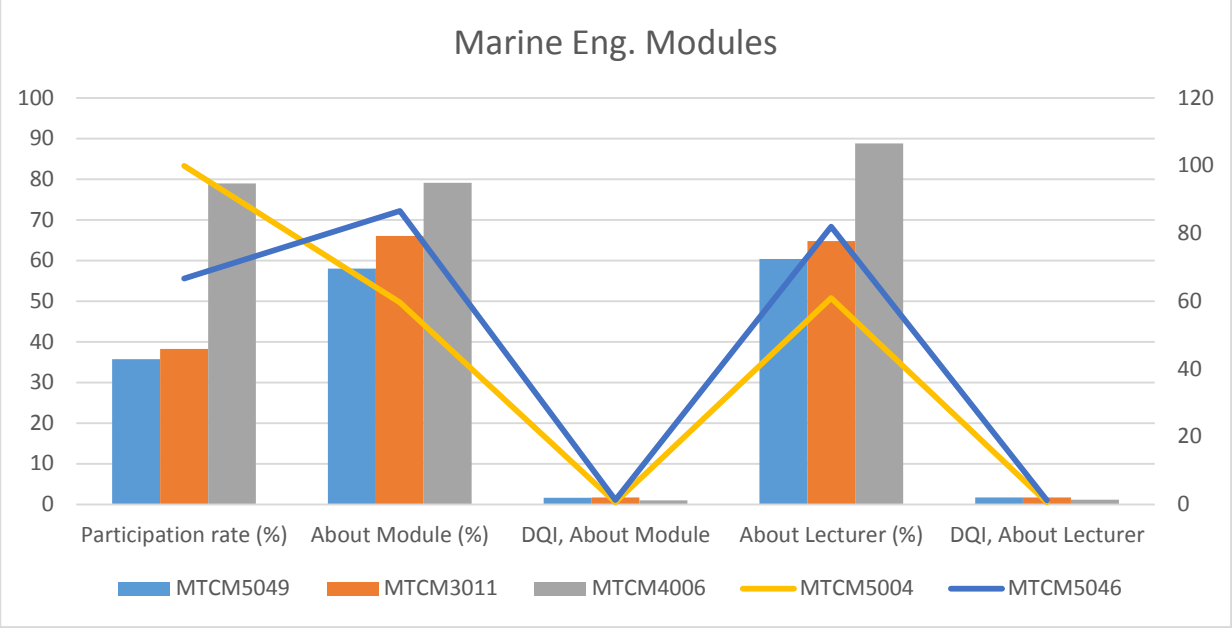

Figure 4. Student satisfaction score and DQI for Marine Engineering Programme modules

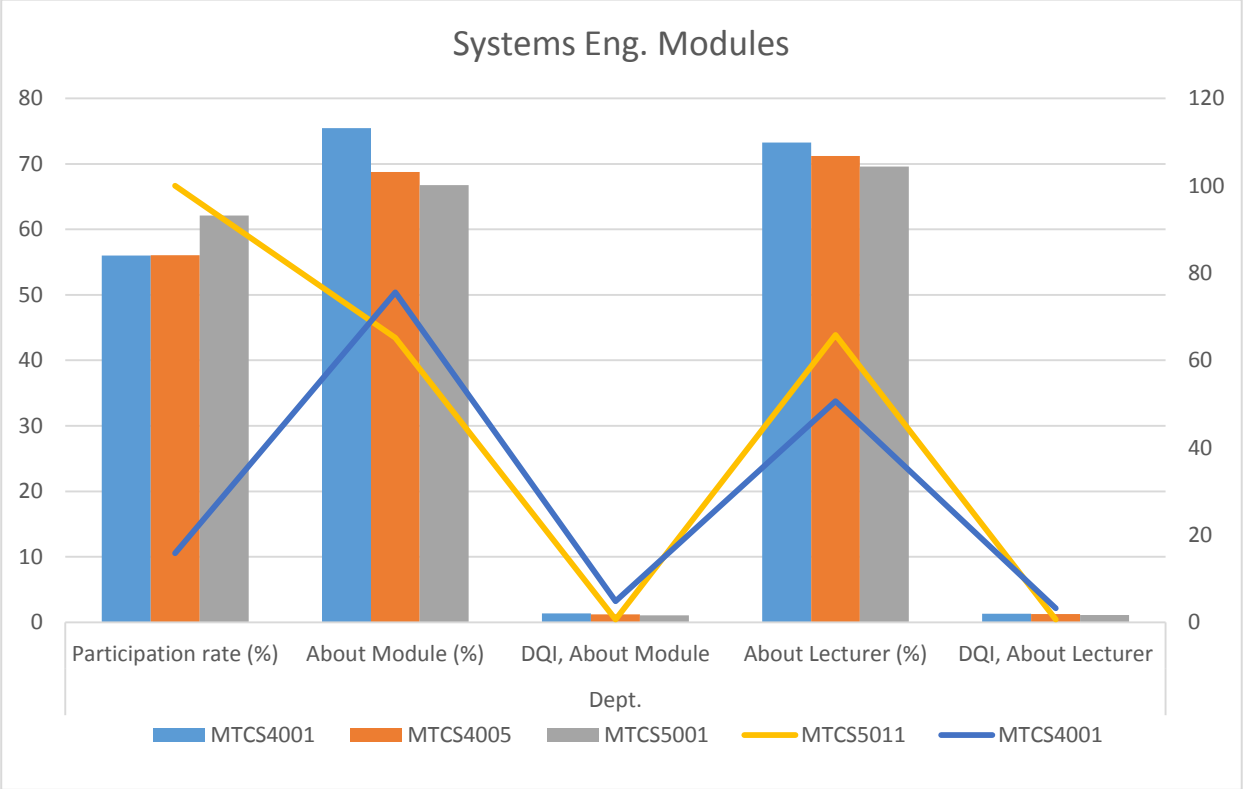

Figure 5. Student satisfaction score and DQI for Systems Engineering Programme modules

For example, the comparison of the satisfaction score of MTCA4020 with MTCA3001 shows that under 7.79% participation rate, the student's satisfaction scores (in MTCA4020) about module and about lecturer are 50% and 60% respectively; and for MTCA3001, under 29.63% participation rate, it is 54.14% and 52.5% respectively. The satisfaction level above 50% could be treated as good if participation rate is ignored. If the same data is converted to DQI, then for MTCA4020 the DQI about module and about lecturer are 6.5 and 7.8 respectively indicating low satisfaction. Whereas, for MTCA3001 the DQI about module and about lecturer are 1.8 and 1.75 respectively indicating a medium satisfaction. Similar comparison results were found for other modules.

Based on DQI as an institutional approach, and for maximum information usability and assessment of module performance, the students were more satisfied in module MTCA5030 owned and managed by Aeronautical Engineering Dept.; in module MTCC3009 (section 2) owned and managed by Civil Engineering Dept.; in module MTCM5004 owned and managed by Marine Engineering Dept.; and in module MTCS5011 owned and managed by Systems Engineering Dept.

5. Conclusions

The engineering programme was monitored via student's skills assessment in engineering and TNA modules, student feedback using data quality index, and audit of teaching materials. It was observed that the quality was relevant to contemporary universities. The analysis of the last two and half academic years' student performance suggests that student performed well and the governance of the programme through QA regulations and processes witnessed the effectiveness of the engineering programme in a new military learning environment.

The adoption of the DQI as an institutional approach, was found appropriate for assessment of module performance. The students were more satisfied in module MTCA5030, MTCC3009 (section 2), MTCM5004, and MTCS5011. The coherence of the engineering modules with TNA modules within available teaching hours was effective in achieving the objectives of the programme. The pre-accreditation reports of the accreditation bodies including IMechE, IE, IMarEST, EASA, etc. suggest that to this point minimum quality assurance and standards are met by the MTC. The report on annual review of standards and quality by university of Portsmouth, UK, covering six engineering programmes, one science programme and one engineering management programme commented that all programmes were completed successfully for Levels 3, 4, 5, and 6 across four engineering departments with comparable improvements. In this context the QA Department foresees no hindrance to the accreditation of engineering programmes offered by MTC. The graduates of MTC will have better recognition of their engineering qualifications locally and globally. The findings of this case study suggest a need for further monitoring of the same four areas in two years' time after the graduation of the first cohort.

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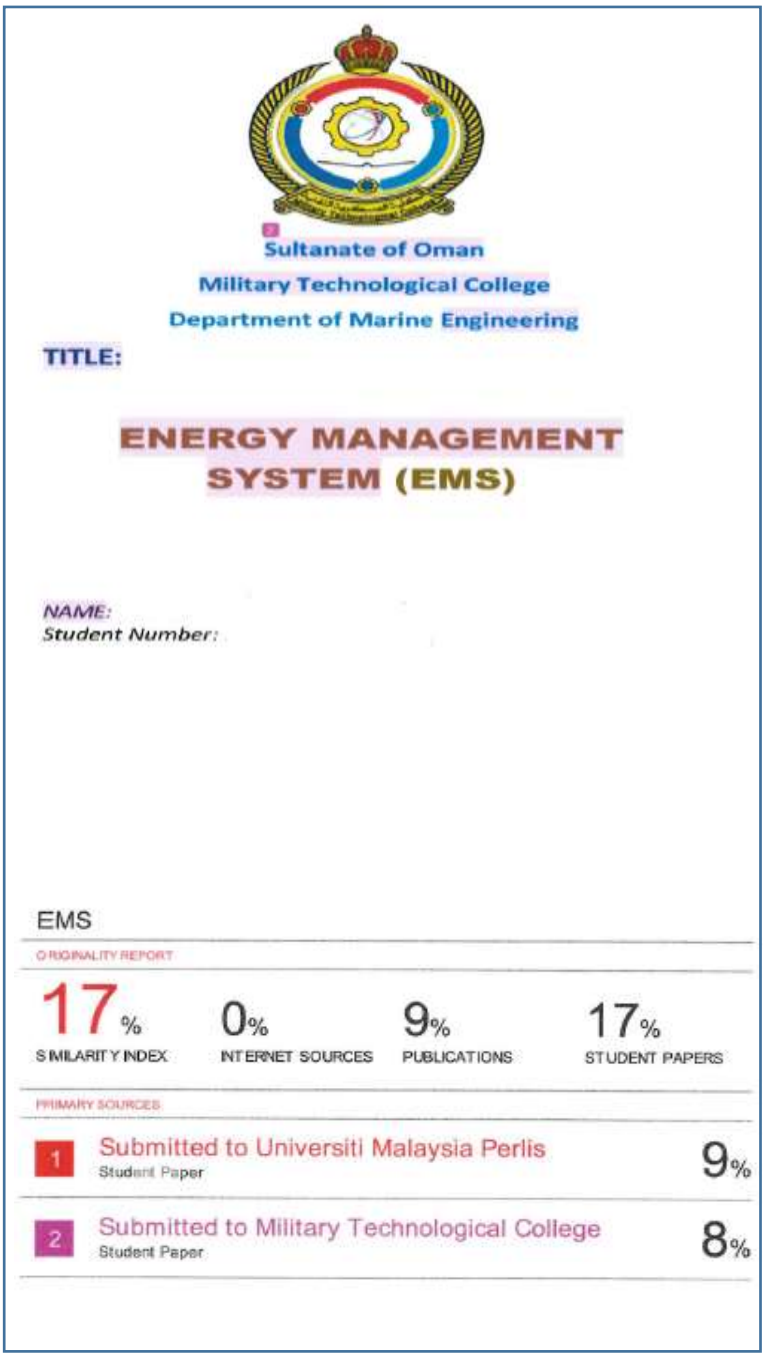
Appendix A – Assignment checked by Turnitin



Sultanate of Oman

Military Technological College

Department of Marine Engineering

TITLE:

ENERGY MANAGEMENT SYSTEM (EMS)

NAME:
Student Number:

EMS

ORIGINALITY REPORT

17%	0%	9%	17%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universiti Malaysia Perlis Student Paper	9%
2	Submitted to Military Technological College Student Paper	8%

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Appendix B – TNA Workshop

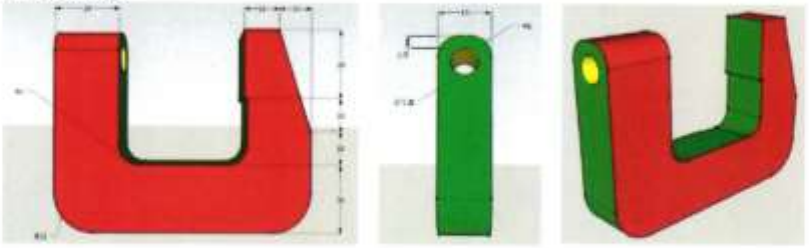
TNA ASSIGNMENT SHEET

TNA Module: Engineering Workshop Practices
Module Code: TNA A 3010
Assignment No.: TNA-L3-EWP01 **Topic:** Hand Tools/skill project
Pathway: All Marine Pathways **Date:**
Student Name: **Student No.**

Project Material Required:

- Mild steel work piece. 100 (L) x 70 (W) X 15 (H)mm
- Files. (Bustard & Smooth)
- Scriber.
- Odd leg caliper.
- Height gauge.
- Engineering ruler.
- Engineering square.
- Divider.
- Hacksaw.
- Ball pain hammer.
- Drill press and drill bit size 10mm.
- Punch. (Centre & Letters)
- PPE. (Gloves, Safety Glass, Overall, Safety Shoes)

Project Drawing:



Project Working Steps:

Work Piece Preparation

- Punch your Official Number at the work piece surface.
- Check the work piece sizes. Use the best corner as reference (Side 1).
- Work on (Side 1) using file to obtain flat surface.
- Work on the adjacent side (Side 2) using file to obtain flat surface and perpendicular with side 1.
- Mark the surface next to (Side 3 & Side 4) with the given sizes from (Side 1 & Side 2).
- Cut the exceed part from (Side 3) by hacksaw and then file it to obtain flat surface, perpendicular with (Side 2) and parallel to (Side 1).
- Cut the exceed part from (Side 4) by hacksaw and then file it to obtain flat surface, perpendicular with (Side 1 and 3) and parallel to (Side 2).
- Give a smooth filing to both surface (Surface A & B). Ensure the surface flatness.

Work Piece Marking and Drilling

- Mark (Surface A) with the given dimension using height gauge, caliper, scriber & Eng. Ruler.
- Punch the work pieces intersecting points using centre punch.
- Drill 12 holes (6 Holes 8mm & 6 Holes 10mm).
- Cut & Smooth the drilled area (3 Internal Corners) until achieving the required sizes.

Project Finishing

- Mark (Surface A) with the given dimension using protector, scriber & Eng. Ruler.
- Cut & Smooth the marked corners (3 Outer Corners) until achieving the required sizes.
- Mark, Drill (8.5mm) & Tap the work piece corner as per the drawing.

Marine Engineering Department **Academic Year 2015/2016**

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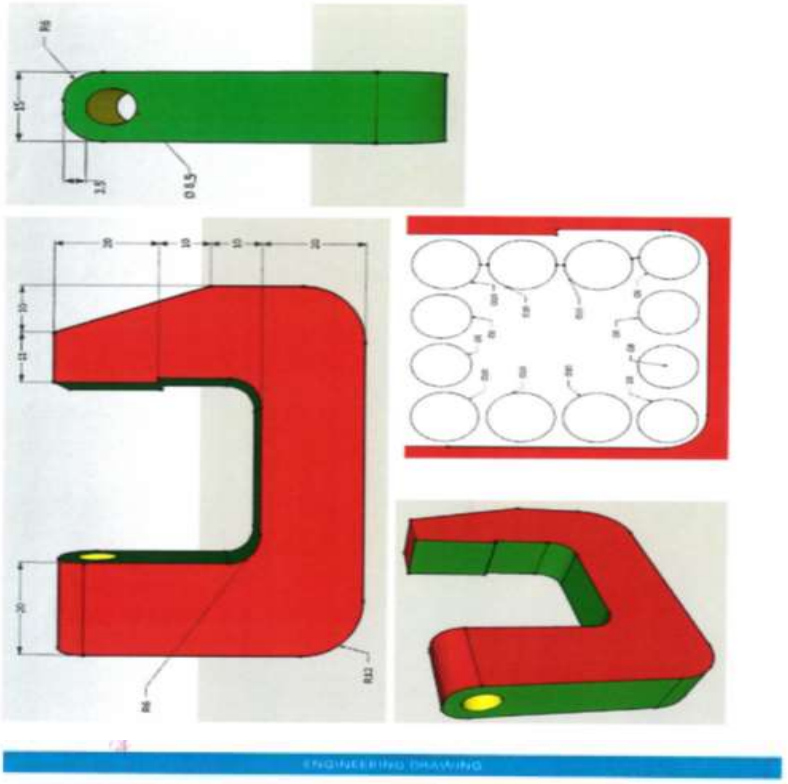
Appendix B – TNA Workshop (continued from previous page)



ENGINEERING DRAWING

Engineering Workshop Practices TNAH3010 Assessment

Your Name:

Number:

Date: 3 0 / 1 / 2 0 1 5

ENGINEERING DRAWING

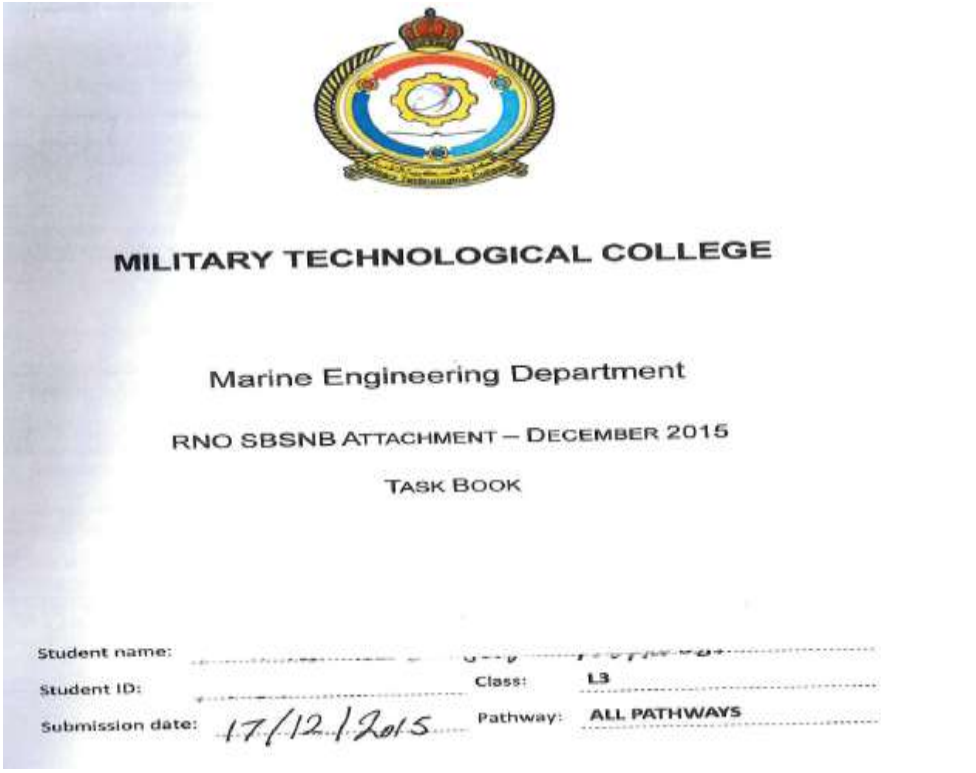
Time: 1 hour 45 minutes | 04 Pages

You must have: Ruler graduated in centimeters and millimeters, pair of compasses, set squares, pen, HB & 2B pencils, eraser.

Total Marks: 41 / 80

51 %

Appendix C – TNA Task book



MILITARY TECHNOLOGICAL COLLEGE

Marine Engineering Department

RNO SBSNB ATTACHMENT – DECEMBER 2015

TASK BOOK

Student name: .....

Student ID: ..... Class: L3

Submission date: 17/12/2015 Pathway: ALL PATHWAYS

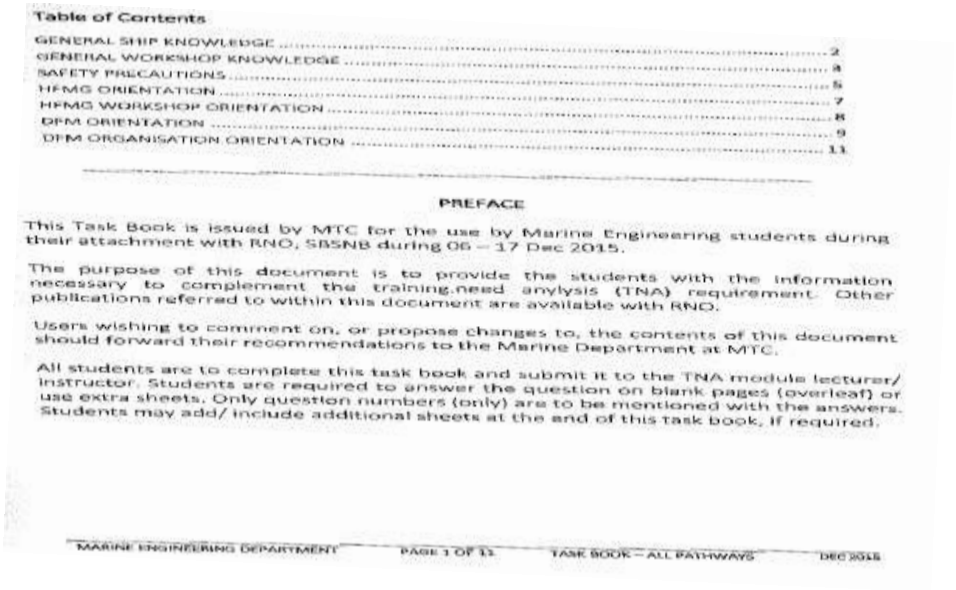


Table of Contents

PREFACE

This Task Book is issued by MTC for the use by Marine Engineering students during their attachment with RNO, SBSNB during 06 – 17 Dec 2015.

The purpose of this document is to provide the students with the information necessary to complement the training need anylysis (TNA) requirement. Other publications referred to within this document are available with RNO.

Users wishing to comment on, or propose changes to, the contents of this document should forward their recommendations to the Marine Department at MTC.

All students are to complete this task book and submit it to the TNA module lecturer/ instructor. Students are required to answer the question on blank pages (overleaf) or use extra sheets. Only question numbers (only) are to be mentioned with the answers. Students may add/ include additional sheets at the end of this task book, if required.

MARINE ENGINEERING DEPARTMENT PAGE 1 OF 11 TASK BOOK – ALL PATHWAYS DEC 2015

Continued on next page

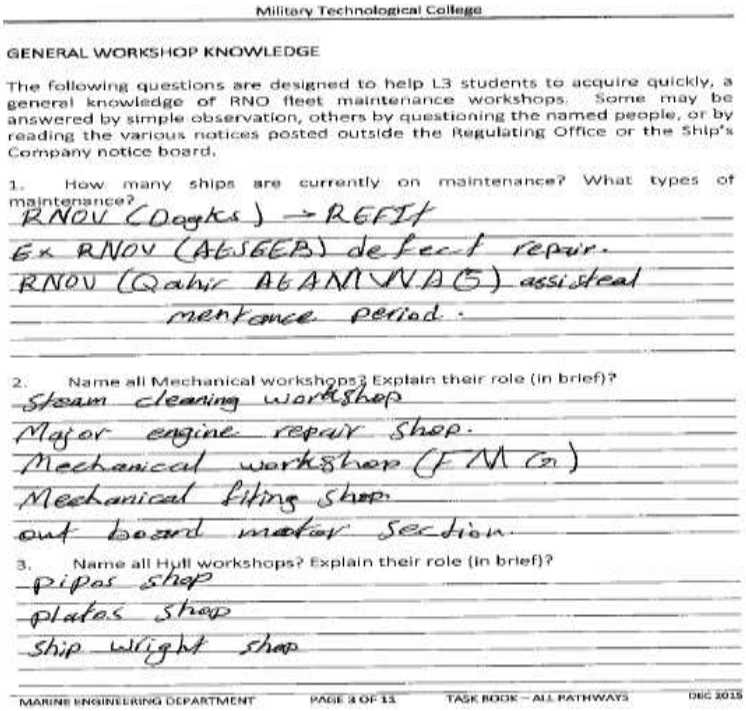
Appendix C – TNA Task book (continued from previous page)

GENERAL SHIP KNOWLEDGE

The following questions are designed to help L3 students to acquire quickly, a general knowledge of RNO ship. Some may be answered by simple observation, others by questioning the named people, or by reading the various notices posted outside the Regulating Office or the Ship's Company notice board.

1. Insert Ship's name: QAHIR AL AMWAAJ
   The year the ship was built: 1996
   The Pennant number: C-31
   The builder: Vosper Throni craft
2. What is your ship's role: Doing patrols to give cover from any threat
3. Obtain from the Engineer's Office, or the Senior Tech ME staff:
   a. Overall length: (m) 83.8 m
   b. Beam: (m) 11.5m
   c. Draught (mean): (m) 4.6 m
   d. Displacement: (tonnes) 1480 tonnes
4. What is the ship's complement?
   a. Officers: 16
   b. Senior Rates: 30
   c. Junior Rates: 34
5. Visit all decks in the ship. List down five (05) important compartments under the responsibility of Mechanical Engineering department with their NBCD Markings.
   Engine room
   MCR
   generator room
   Fresh water compartment
   Steering room

MARINE ENGINEERING DEPARTMENT PAGE 2 OF 11 TASK BOOK – ALL PATHWAYS DEC 2015



Military Technological College

GENERAL WORKSHOP KNOWLEDGE

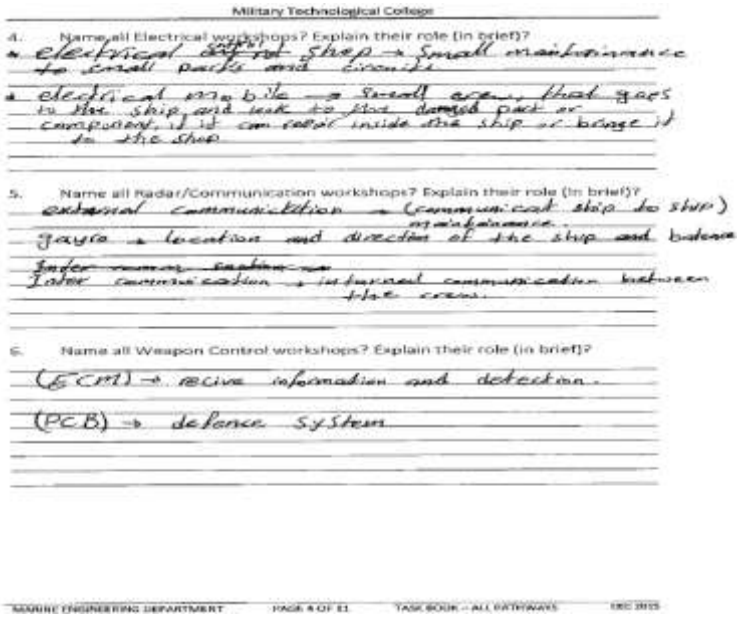
The following questions are designed to help L3 students to acquire quickly, a general knowledge of RNO fleet maintenance workshops. Some may be answered by simple observation, others by questioning the named people, or by reading the various notices posted outside the Regulating Office or the Ship's Company notice board.

1. How many ships are currently on maintenance? What types of maintenance?
   RNOV (Dogks) → REFIT
   6x RNOV (ABSGEB) defect repair.
   RNOV (Qahir Al AMWAJ) assistead mentance period.
2. Name all Mechanical workshops? Explain their role (in brief)?
   Steam cleaning workshop
   Major engine repair shop.
   Mechanical workshop (FM Gr)
   Mechanical fiting shop
   out board motor section.
3. Name all Hull workshops? Explain their role (in brief)?
   pipes shop
   plates shop
   ship wright shop

MARINE ENGINEERING DEPARTMENT PAGE 3 OF 11 TASK BOOK – ALL PATHWAYS DEC 2015

Continued on next page

Appendix C – TNA Task book (continued from previous page)



Military Technological College

4. Name all Electrical workshops? Explain their role (in brief)?

- electrical depot shop → small maintainance to small parts and circuit.
- electrical mobile → small area, that goes to the ship and look to the damage part or component, if it can repair inside the ship or bringe it to the shop

5. Name all Radar/Communication workshops? Explain their role (in brief)?

external communication → (communicat ship to ship) maintainance.
gayro → location and direction of the ship and balance
Inter room cabine →
Labor communication → internal communication between the crew.

6. Name all Weapon Control workshops? Explain their role (in brief)?

(ECM) → recive information and detection.
(PCB) → defence system

MARINE ENGINEERING DEPARTMENT PAGE 4 OF 61 TASK BOOK – ALL PATHWAYS DEC 2015

Appendix D – Student Evaluation Questionnaire (SEQ)

Three questions about the lecturer:

Q.1. The module's aims, learning outcomes, syllabus, assessment strategy, weightage of each artefact and module pass requirements were made clear to me since the beginning of the module.

Q.2. Sufficient resources: Course notes, online material, activities, and references were available in Moodle and Learning Resource Centre.

Q.3. The work load for this module is manageable and the coursework was achievable.

Five questions about the lecturer:

Q.1. Lecturer's language was understandable and his explanation of topics and module contents was useful and easy to understand.

Q.2. Lecture and teaching materials were adequate and well prepared by lecturer.

Q.3. Feedback on my work (reports, assignments, exams, etc.) was provided within the specific period and it helped me improve.

Q.4. The lecturer has used the modern teaching aids/gadgets such as smart board, Moodle, and videos that enhanced my understanding of module contents.

Q.5. The lecturer encouraged discussions and responded to questions and stimulated student participation.