ENROLLING NON-CONVENTIONAL STUDENTS IN UNIVERSITIES: A CASE STUDY OF MANUFACTURING TECHNOLOGY DEGREE AT UNIVERSITY OF VOCATIONAL TECHNOLOGY

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INTRODUCTION

National Vocational Qualification Framework of Sri Lanka (NVQFSL) was established to provide upward mobility to those who enter to the Technical and Vocational Education and Training (TVET) sector. It consists of seven levels; 1 to 4 are certificate levels and 5 to 6 are diploma levels while level-7 is the degree (TVEC, 2005). University of Vocational Technology (UoVT) was established by the Sri Lankan parliament act 31 of 2008 (UoVT, 2008), to deliver the level-7 qualifications. NVQ level 5 or 6, or equivalent diploma qualifications are considered as entry qualifications for the level -7 bachelors' degrees. UoVT conducts the same degrees during weekdays as well as weekends.

The university launched the delivery of Manufacturing Technology degree course, at the start of delivery of other degree courses, in 2010 (UoVT, 2010, 2011). Though the first batch of Manufacturing Technology enrolled in 2010 was for a weekend programme, delivery of weekday programmes was started in 2011(UoVT, 2012). The course seems to have a lower demand compared to the parallel intakes for the other degrees (UoVT, 2012, 2014a, 2016a). No students were enrolled for any degree programme in 2012 (UoVT, 2013) and no students were enrolled for weekday programmes of Manufacturing Technology in 2014 (UoVT, 2015) and 2016 (UoVT, 2017), due to insufficient number of applicants.

NVQ diploma holders in the disciplines of Automobile, Production, Refrigeration & Air-conditioning and Farm Machinery, and non-NVQ diploma holders in mechanical field are considered eligible to enrol in the degree course (Dayawansa, 2009). Many of NVQ students have not performed well in the course. Comparison of their semester results showed significant differences of performance of students of Manufacturing Technology compared to the students of other degrees of the same faculty (UoVT, 2014b, 2016b, 2018).

Conventional university students are the ones who entered the university directly after completion of their secondary schooling. Students entering universities through other paths than this and /or having multiple roles, and age 25 years or more are classified as non-conventional students (Davia, 2017). Accordingly, NVQ students are non-conventional students, as they do not enrol to the university just after the completion of their secondary education at schools; instead, they enrol with tertiary educational qualifications.

However, the performance of these non-conventional students who enter the degree with different diploma qualifications may not be equal, as their entry level competencies are different. A foundation programme is offered before commencement of semester-1 of the degree, with the aim of addressing the deficiencies of entry level competencies. However, the success of such foundation programme as well as the performance levels of core modules of different diploma holders have not been studied yet. Therefore, this study aimed to address this gap.

Therefore, objectives of the study were to compare performance of Manufacturing Technology undergraduate students with respect to their entry qualifications.

METHODOLOGY

It is assumed that the students with diploma qualifications should have more practical know-how than the theoretical aspects. Therefore, core modules which are theoretically slanted were selected as sample modules to study in detail, which are delivered in first and second semesters of the degree. Secondary data available in the examination division of the semesters 1 and 2 of the weekday programmes of 2011/12, 2013/14 and 2015/16 student intakes were used in the study.

Looking at the objectives of the research, descriptive survey study design with documentary analysis focus was used as the research method. The study utilised secondary data only.

Due to a limited number of students, calculated average marks of modules were not reasonable in certain instances, when there were major deviations of performance levels among students.

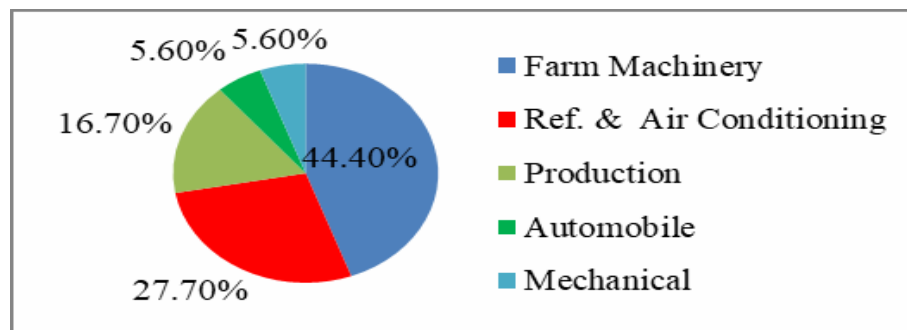**RESULTS AND DISCUSSION**

Figure 1: Percent student enrolments with respect to different diploma fields

According to the Figure 1, it can be seen that majority of students (44.4%) have enrolled with NVQ diploma in the Farm Machinery, and next is the NVQ diploma in Refrigeration and Air-conditioning.

Figure 2 indicates the average marks of the modules, Engineering Mathematics-1, Engineering Chemistry and Engineering Physics of semester-1 with respect to entry field. It can be clearly seen that those who enroled with a diploma in Refrigeration and Air conditioning perform poorly, since the average marks of all three modules show a clear reduction compared to students of all other fields. Since the minimum required mark to obtain a weak pass is 30, average marks of 21.0 and 26.8 for the modules of Engineering Physics and Engineering Chemistry respectively, may not allow them to complete the degree successfully, within that semester.

Similarly, those with Farm Machinery field also show a somewhat poor performance in semester-1 since their average marks of all three modules are lower than the remaining three fields. Average mark of 29.0 for Engineering Physics may not allow them to complete the degree within that semester. The average performance of Production diploma holders in all three modules is moderately acceptable.

Diploma holders of non–NVQ Mechanical field show the best average marks for all three modules, with minimum of 67.3 marks for Engineering Chemistry, and their performance in Engineering Mathematics-1 is at a elevated level with an average of 90.7 marks. Performance of automobile field is also better with 59.0 average marks for both Engineering Chemistry and Engineering Physics, and 79.0 average marks for Engineering Mathematics-1.
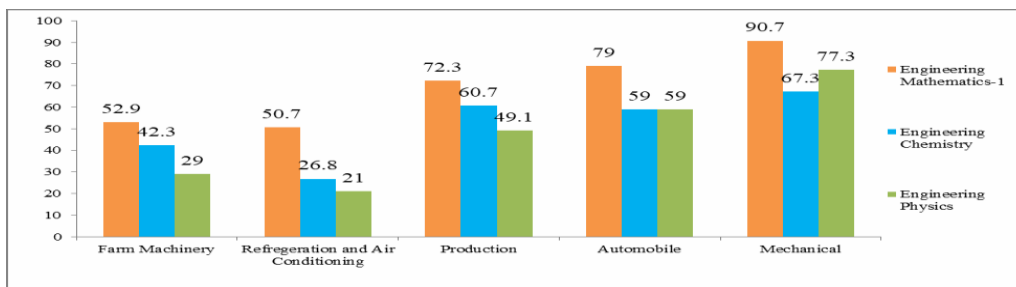
Figure 2: Average module – marks in semester 1 with respect to diploma fields

Those who have entered from all diploma fields have scored the highest marks for Engineering Mathematics-1. In Engineering Physics, weaker performance was observed from those with Farm Machinery, Refrigeration & Air-conditioning and Production Technology diplomas. Mechanical field's performance in Engineering physics is better than Engineering Chemistry while Automobile students show equal average performance in both of those modules.

Figure 3 shows average marks of three of semester-2 modules for different diploma holders. As in semester-1, Refrigeration & Air-conditioning diploma field has shown the weakest performance, while Mechanical and Automobile fields have shown the best performance in all three modules.
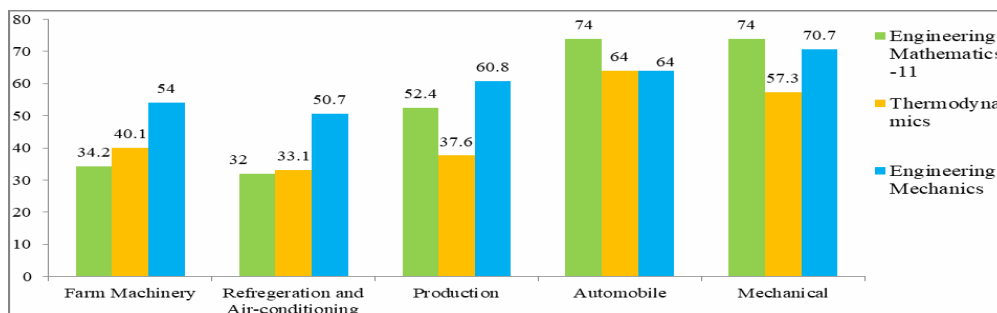

Figure 3: Average module – marks in semester 2 with respect to diploma fields

In contrast to semester-1, both, Refrigeration & Air-conditioning and Farm Machinery diploma fields have shown the weakest performance in mathematics module in comparison to the other two modules. However, Automobile and Mechanical diploma holders have shown the best performance in mathematics module, similarly in semester-1. Average performance in Thermodynamics for Refrigeration & Air-conditioning and Production fields is not satisfactory. However, average performance of all students is better in semester-2 than in semester-1. The results above clearly indicate a gap between the expected entry level competencies and the actual competencies, the students possess, especially in Refrigeration and Air-conditioning and Farm Machinery diploma fields. However, during the course of studies at the university in semester -1, these students acquire the competencies to fill that gap. Therefore, their performance in semester-2 is better compared to that of semester-1. Hence, it can be inferred that, all those students possess the abilities to acquire the concerned knowledge and skills, they had not been given an exposure at the diploma awarding agencies, towards this. This needs to be seriously considered by the concerned diploma awarding institutions.

CONCLUSIONS
According to the findings of the research, following are the conclusions are arrived at.
- Overall performance of Farm Machinery and Refrigeration & Air-conditioning diploma holders is comparatively weaker than students from other fields.
- Since NVQ diploma holders in Automobile field and non-NVQ diploma holders in

Mechanical field perform better in Manufacturing Technology, those are the diplomas most relevant for this degree course. Performance of Production diploma field in Manufacturing Technology is moderately acceptable.

- Since Manufacturing Technology is the only technological degree applicable for diploma holders in Farm Machinery field, all such candidates with aspiration to follow a degree tend to register in this degree course. Since the number of Farm Machinery diploma holders in Manufacturing Technology is proportionately larger, it causes the overall performance of the students of this degree to be weaker compared to the overall performance of other degree fields.

RECOMMENDATIONS
- Implement a more intensive foundation programme for NVQ diploma holders in Farm Machinery and Refrigeration & Air-conditioning fields, especially for modules they perform poorly in.
- Communicate these findings to the agencies delivering NVQ level 5 or 6 qualifications.
- Since advance level qualified students also enrol in weekday programmes of the degree from 2017/2018 intake onwards, conduct a similar study to assess their performance levels.
- Collect details of the Farm Machinery and Refrigeration & Air-conditioning NVQ diploma holders, through a structured questionnaire, mainly to verify whether they have obtained the competencies prescribed in their diploma courses.

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