

Online Mathematics Diagnostic Tool

Report 2018

1.0 INTRODUCTION

Educationists have had the chance to reach to a large scale audience in a more effective and efficient way through the fast development in Information and Communication Technologies (ICT). Various tools and technologies are created to educate different individuals belonging from many cultural and social backgrounds. “The Faculty of Science Technology and Environment at The University of The South Pacific (USP) had designed an Online Mathematics Diagnostic Tool (OMDT) for all its first year undergraduate students to bridge the gaps in areas of mathematics. This OMDT is a unique project and is the first of its kind to be implemented in the South Pacific. It allows students to do their tests online from anywhere around the university campuses and as well as from their homes using laptops, smart phones, tablets with internet connectivity. The major function of OMDT is to provide an early indication as to which students lack behind in their skills of mathematics and provide help such as remedial. Mathematics is part of everyday life, and proved beneficial for students undertaking both science and non-science courses at the University as well.

Furthermore, OMDT consisted of two parts whereby the first part is online test and the second part is remedial if the need aroused. In addition, the test is a multiple choice based test consisting of 40 questions from the five topics namely: Algebra, Function, Differentiation, Statistics and Probability. The test has a time limit of 75 minutes, once a student passed, he/she was required to fill in a ‘students’ feedback questionnaire’ after which they received their certificates. The students were then immediately notified of their results, once a student failed a particular module they were required to do the remedial for that particular module.

OMDT placed every student at the same level. These two units are a great example where mathematics was vital for students to successfully pass their units. Mathematics was also an entry requirement for students coming from secondary school to tertiary institute such as USP.

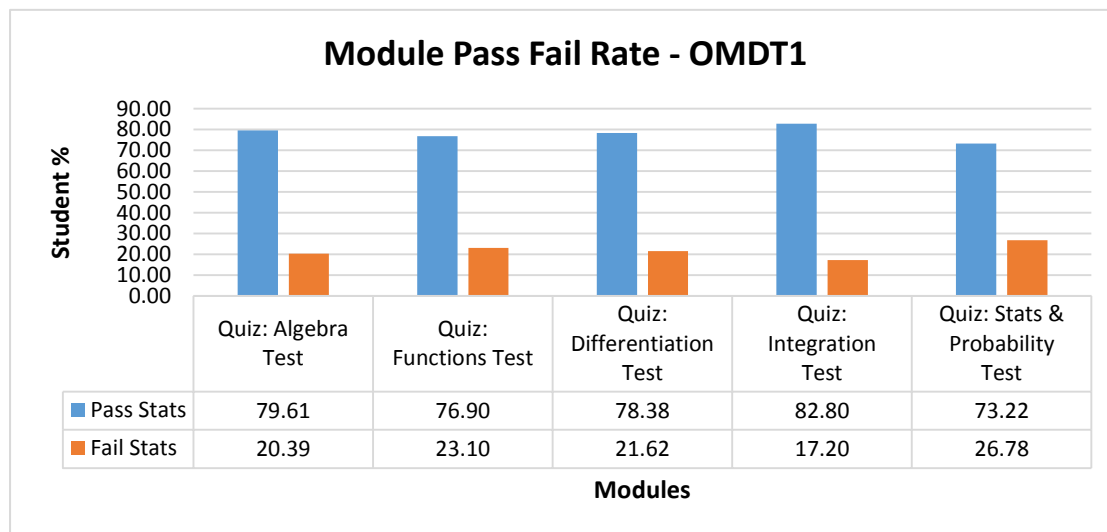
2.0 OMDT Summary

Date: 26/11/18 Data

Summary	OMDT1	OMDT2	Student (Total)
Student enrolled Initially	1644	2655	4299
Not Registered in USP	589	1014	1603
On Hold Status	112	351	463
Total Active Student (SEMESTER 1 & 2)	943	1290	2233
2018 Semester 2 First year Students	203	304	507
Potential student to enrol in 2019	740	986	1726
Completed OMDT	414	831	1245 (72.14%)
Left to complete	326	155	481 (27.86%)

- A total of 4299 students were enrolled in OMDT (OMDT1- 1644 & OMDT2 - 2655)
- A total of 1603 students are not Registered in USP (OMDT1- 589 & OMDT2 - 1014).
- A total of 463 students are on hold status, some holds includes: Fees owing, library fines and etc
- A total of 2233 students are currently active as first year students and 507 of these are enrolled in semester 2 as their 1st year.
- A total of 1726 students needs to complete the OMDT (OMDT1 – 740 & OMDT2 - 986) and from 1726 students 1245 (72.14%) have completed it.
- A total of 481 (27.86%) from 1726 students need to complete the OMDT in order to enrol in their 200 level courses.

OMDT1: The graph below shows the Module Test performance percentage.

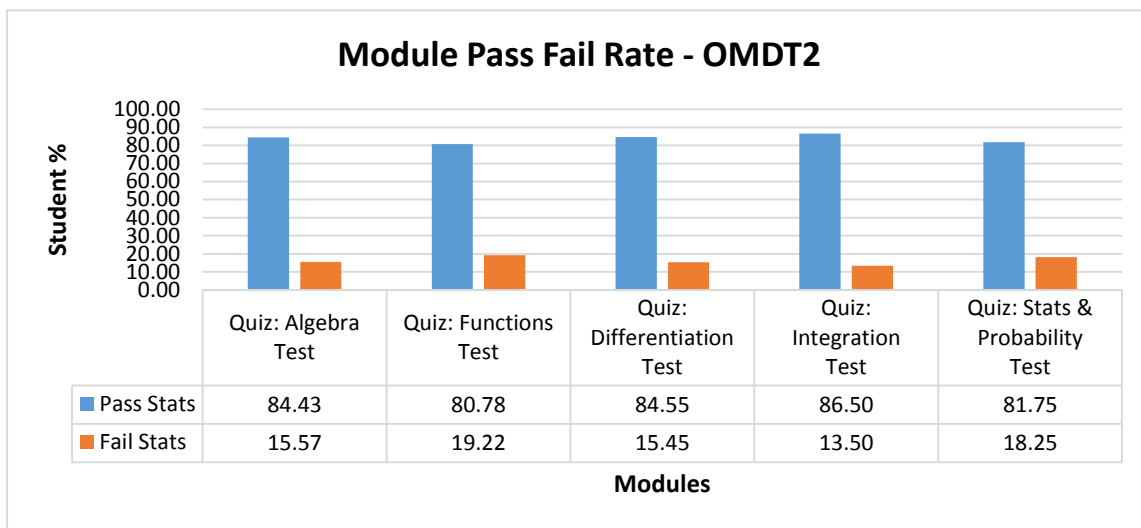


Sample size: 414

The pass rate per module is more than 50% in all 5 modules. From above data, integration module (82.80%) has the highest pass rate compared to other 4 modules. It can also be concluded that the students find difficulties in Stats and Probability (26.78%).

Over roll pass rate: OMDT1: 78.18%

OMDT2: The graph below shows the Module Test performance percentage.

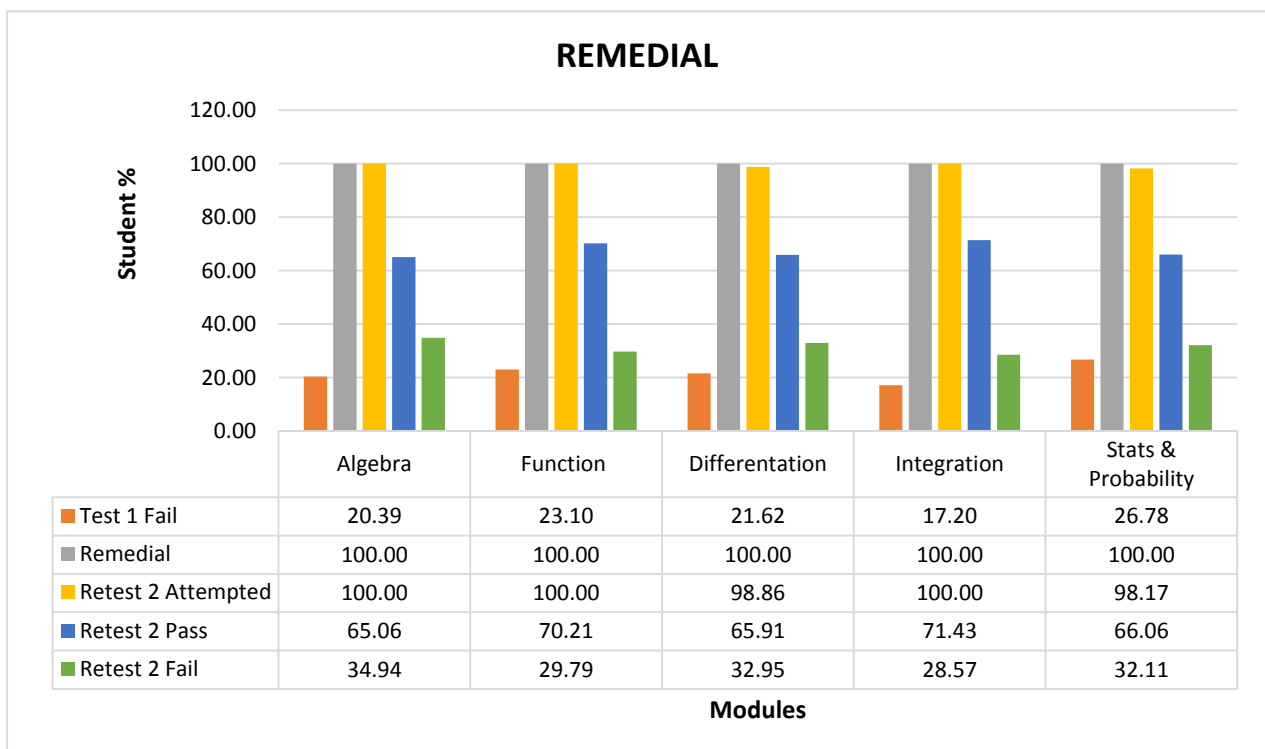


Sample size: 831

The pass rate per module is more than 50% in all 5 modules. From above data, integration module (86.50%) has the highest pass rate compared to other 4 modules. It can also be concluded that the students find difficulties in Functions (19.22%).

Over roll pass rate: OMDT2: 83.60%

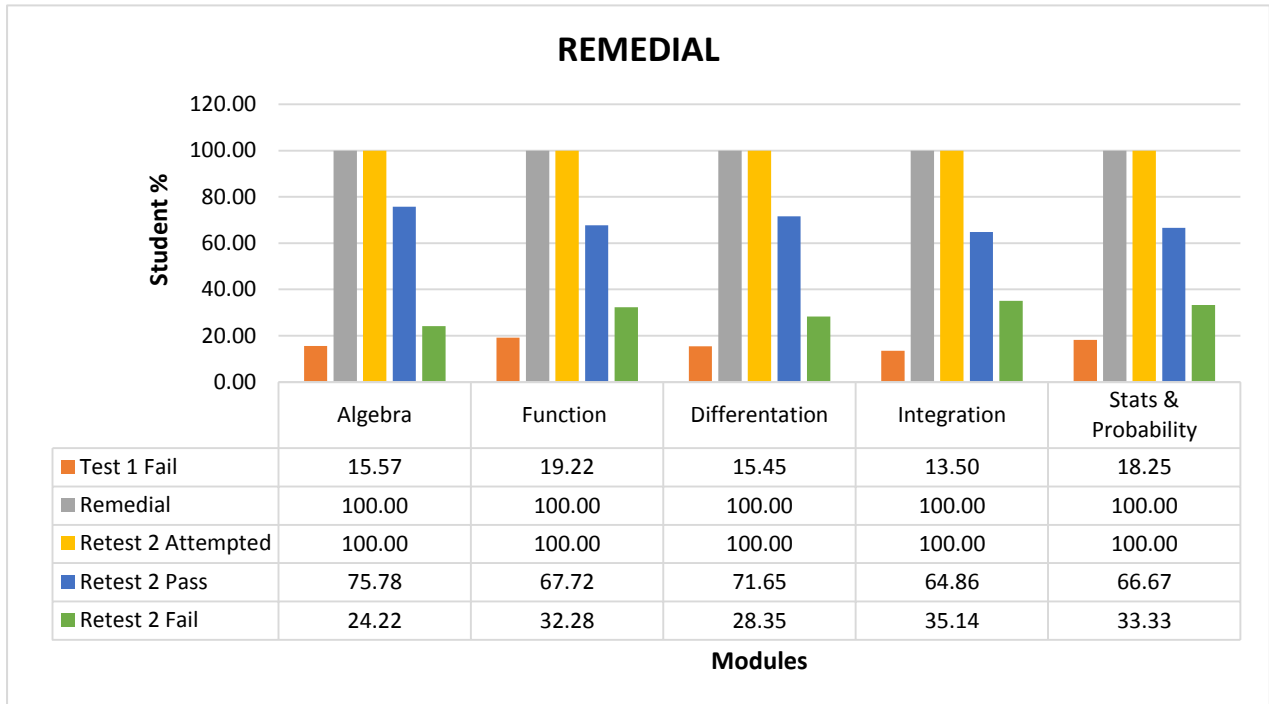
OMDT1: Graph below show student who took remedial and did Re-test after scoring low mark in module test.



Sample size: 414

The above graph shows remedial percentage with respect to 5 modules. After doing remedial student did retest and the pass rate is more than the fail rate. It can be concluded that remedial helps student to improve their math's knowledge.

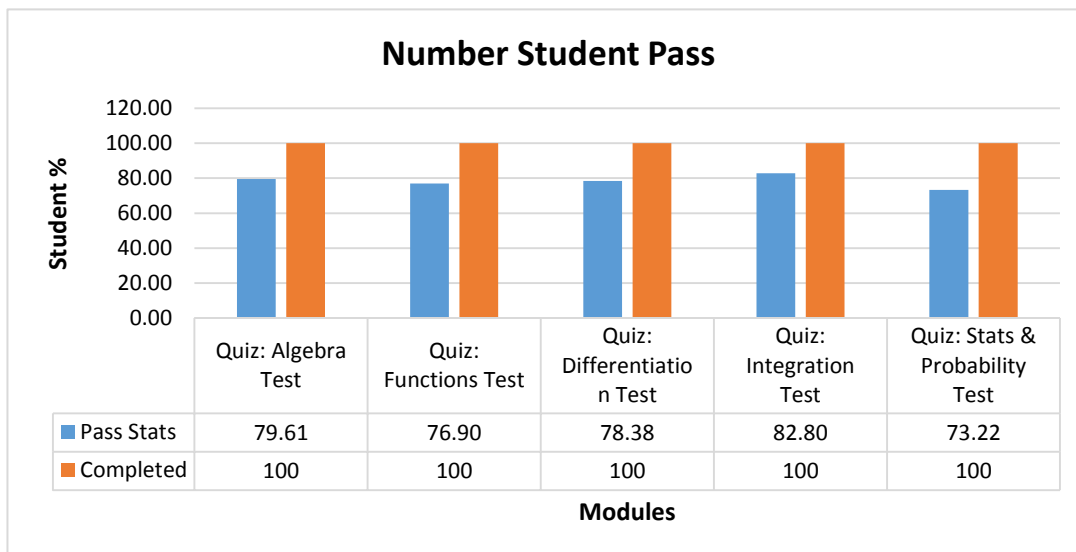
OMDT2: Graph below show student who took remedial and did Re-test after scoring low mark in module test



Sample size: 831

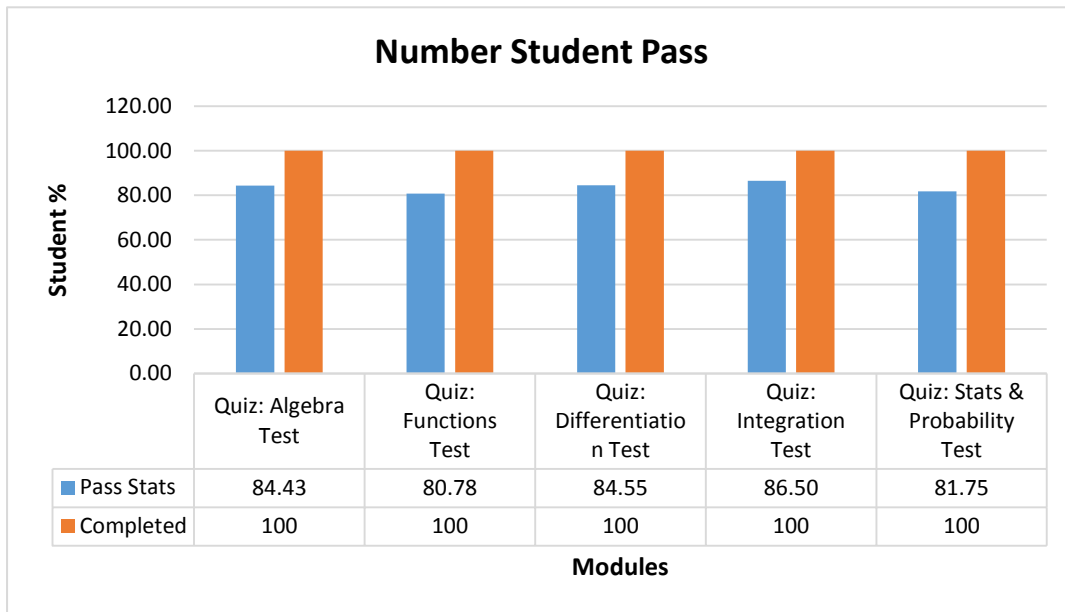
The above graph shows remedial percentage with respect to 5 modules. After doing remedial student did retest and the pass rate is more than the fail rate. It can be concluded that remedial helps student to improve their math's knowledge.

OMDT1: The Graph below shows number of students took OMDT and passed



Over roll pass rate: OMDT1: 78.18%

OMDT2: The Graph below shows number of students took OMDT and passed

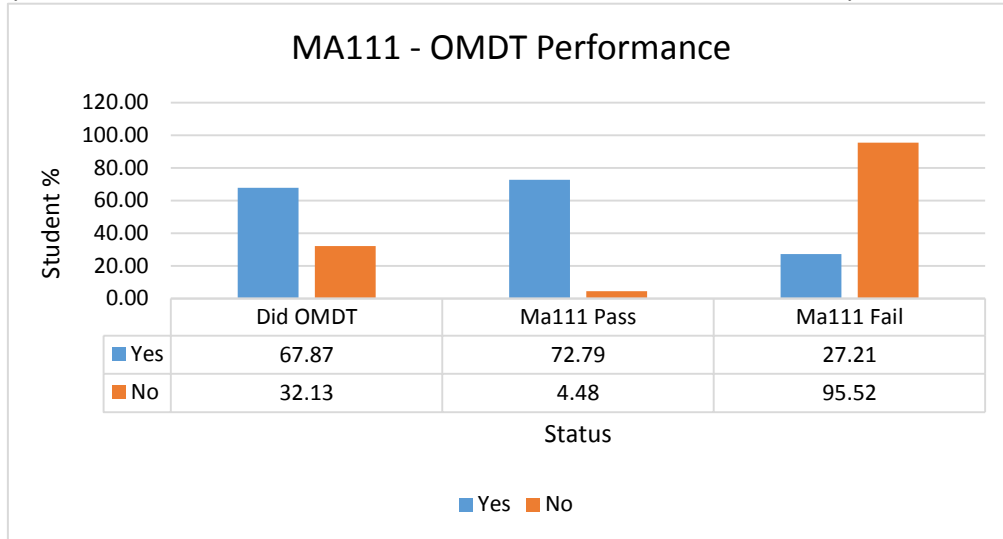


Over roll pass rate: OMDT2: 83.60%

3.0 Performance of students doing OMDT in MA111

Course: MA111
 Semester: One 2018
 Sample Size: 417

The graph below show students who did/didn't took OMDT and their MA111 performance.

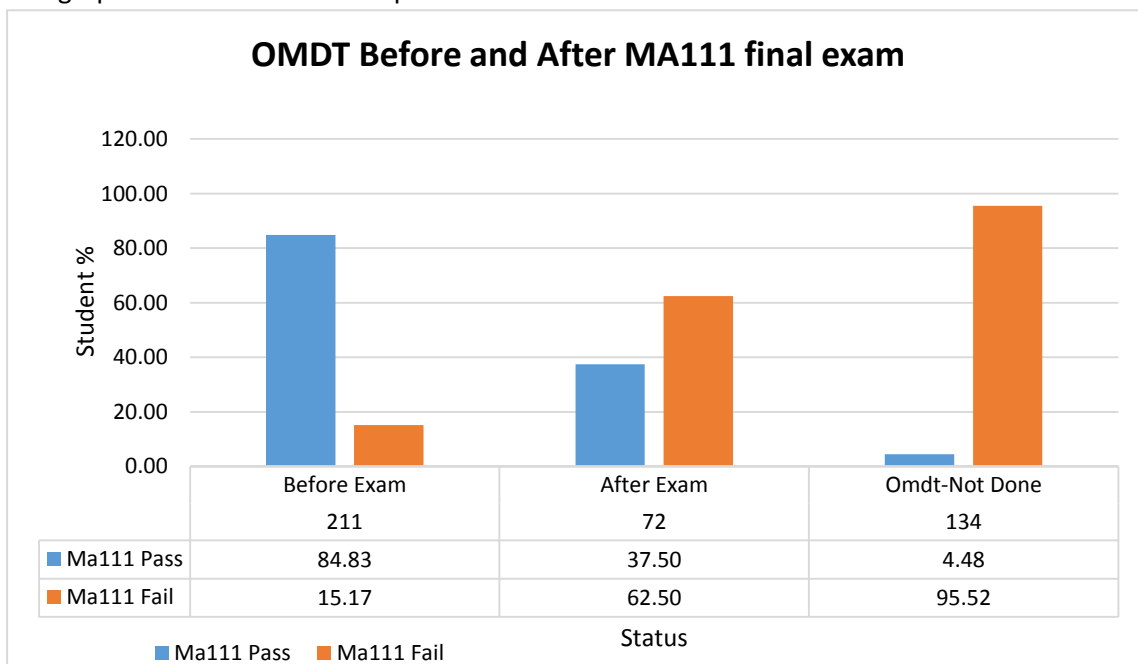


A total of 417 students did MA111 in Semester 1, 2018. Students who did OMDT has higher MA111 percentage pass rate (72.79%) compared to student didn't took OMDT that is 4.48% pass rate.

Student who didn't took OMDT and did MA111 has 95.52% fail rate.

3.1 Performance of students who did OMDT Before and After MA111 final exam.

The graph below show students performance in MA111 who did OMDT before and after finals.



A total of 417 students did MA111 in Semester 1, 2018. Students who did OMDT before final exam has higher MA111 percentage pass rate (84.83%) compared to student who took OMDT after final exam that is 37.50% pass rate.

Student who didn't took OMDT (neither before nor after) and did MA111 has 95.52% fail rate.

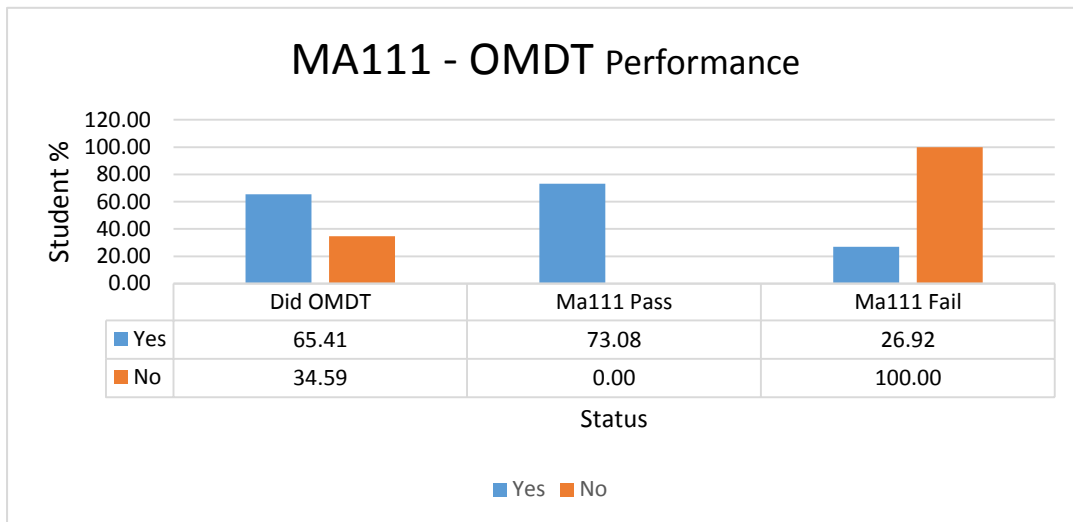
4.0 Performance of students doing OMDT in MA111

Course: MA111

Semester: Two 2018

Sample Size: 159

The graph below show students who did/didn't took OMDT and their MA111 performance.

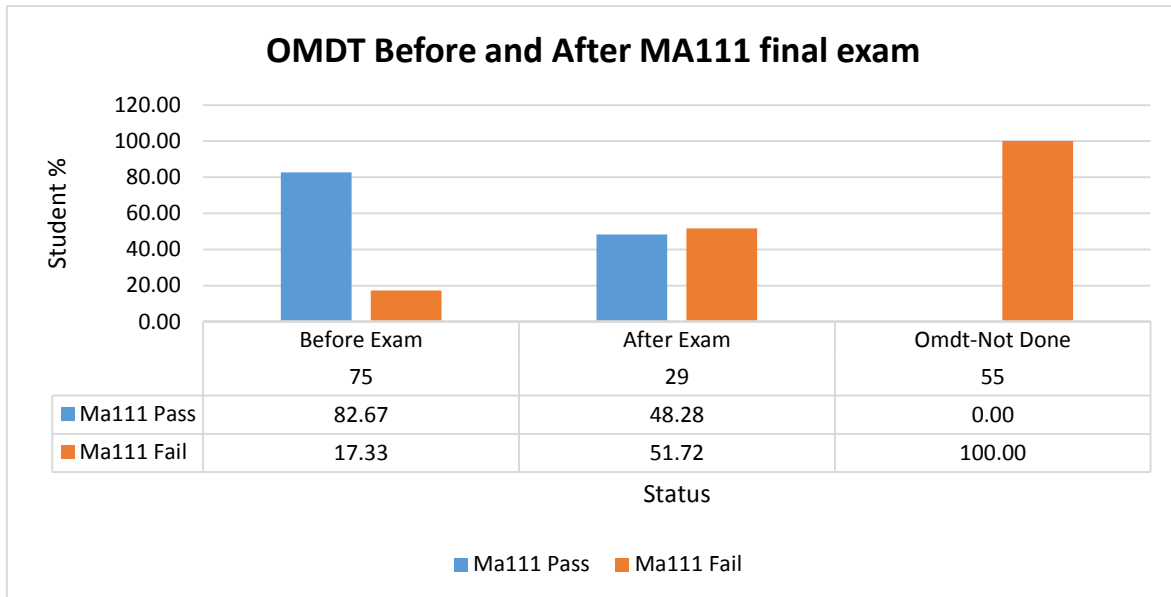


A total of 159 students did MA111 in Semester 2, 2018. Students who did OMDT has higher MA111 percentage pass rate (73.08%) compared to student didn't took OMDT that is 0% pass rate.

Student who didn't took OMDT and did MA111 has 100% fail rate.

4.1 Performance of students who did OMDT Before and After MA111 final exam.

The graph below show students performance in MA111 who did OMDT before and after finals.



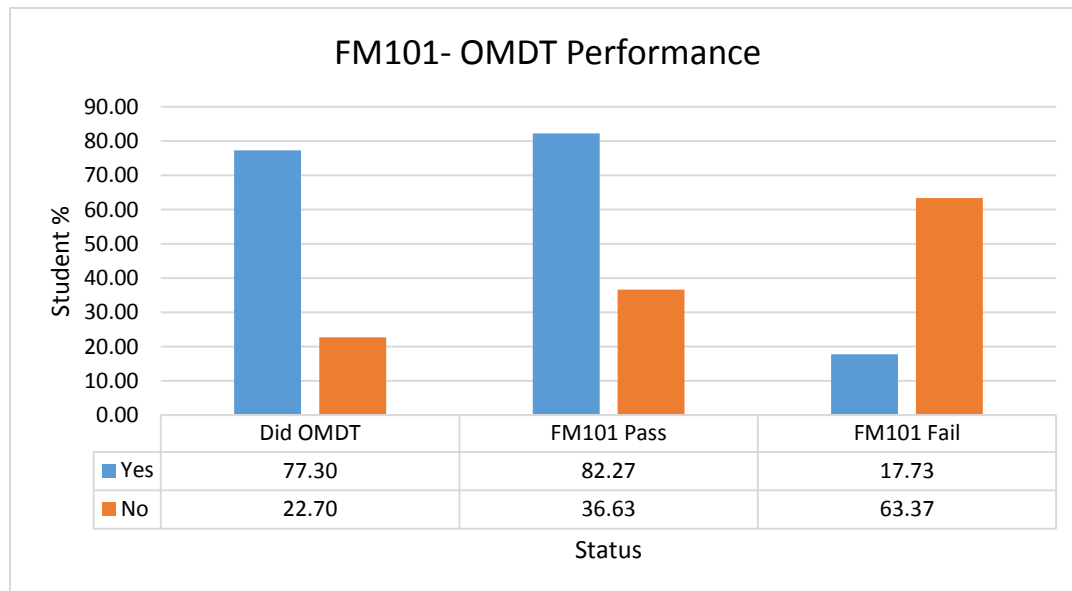
A total of 159 students did MA111 in Semester 2, 2018. Students who did OMDT before final exam has higher MA111 percentage pass rate (82.67%) compared to student who took OMDT after final exam that is 48.28% pass rate.

Student who didn't took OMDT (neither before nor after) and did MA111 has 100% fail rate.

5.0 Performance of students doing OMDT in FM101

Course: FM101
Semester: One 2018
Sample Size: 445

The graph below show students who did/didn't took OMDT and their FM101 performance.



A total of 445 students did FM101 in Semester 1, 2018. Students who did OMDT has higher FM101 percentage pass rate (82.27%) compared to student didn't took OMDT that is 36.63% pass rate.

Student who didn't took OMDT and did FM101 has 63.37% fail rate.

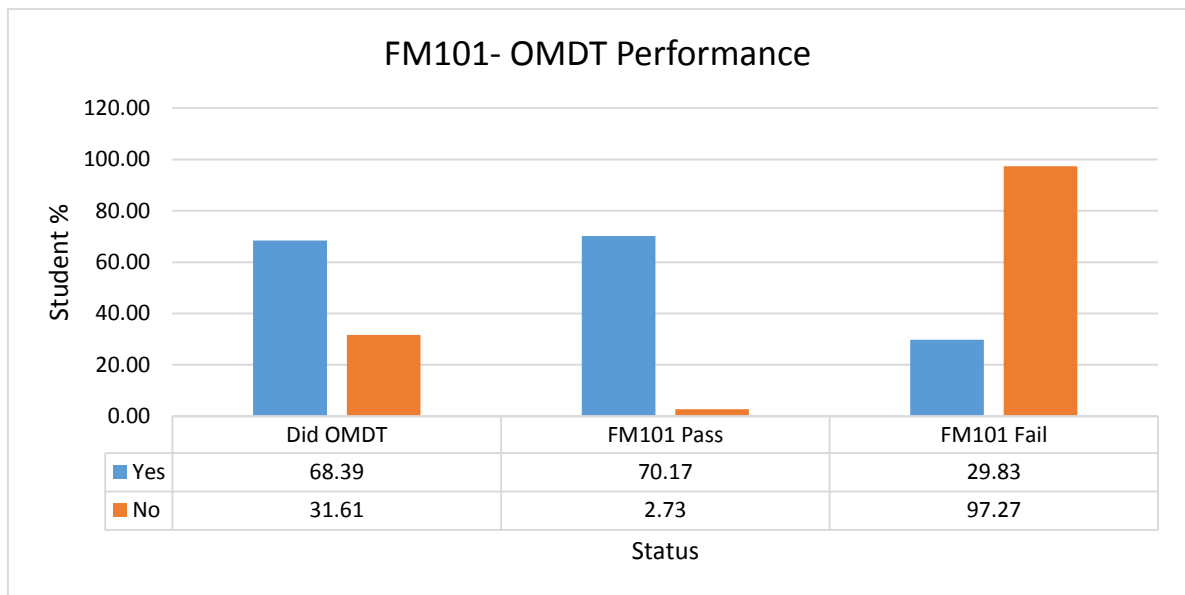
5.1 Performance of students doing OMDT in FM101

Course: FM101
Semester: Two 2018
Sample Size: 348

The graph below show students who did/didn't took OMDT and their FM101 performance.

A total of 348 students did FM101 in Semester 2, 2018. Students who did OMDT has higher FM101 percentage pass rate (70.17%) compared to student didn't took OMDT that is 2.73% pass rate.

Student who didn't took OMDT and did FM101 has 97.27% fail rate.



6.0 Challengers

Some Issues and challenges are highlighted:

- internet connectivity (The problem faced by students is that it takes a lot of time for the remedial package to load)
- Students not reading their offer letter and student email.
- Students not following the instruction carefully (not completing what they told to), as a result some students only completes few topics and thinks they have completed OMDT. OMDT is only completed once students receives certificate.
- Some students leave it for last minute. (end of 100 level)
- Computer illiteracy (some students face difficulties to use computer)

7.0 Recommendation

- Use USP mobile app to notify students to do OMDT.
- More posters and adverts across University and Public areas information about OMDT and its importance
- Course coordinators to add OMDT in their course outline and remind them weekly bases.
- OMDT coordinators to give demonstration in week 1 lectures in doing OMDT to all first year degree students. (Lectures which has large number of students, such as: Accounting, Math's, UU100).
- Students in the regional campuses are given more information by course coordinators and through posters in the campus.
- Campus visits (computer literacy workshop)
- Make sample OMDT before doing final OMDT test

8.0 OMDT version2

- OMDT version 2.0 (using more gamification that is having exit tickets that will allow students some rewards:
- Upgrading Moodle 2.9 to Moodle 3.4.
- New OMDT for non-science students
- USP mobile app to notify students to do OMDT

9.0 Effectiveness

The growing level of advanced technology and tools in the educational sector is providing students with more opportunities to develop more skills and knowledge. The Online Mathematics Diagnostic Tool developed in The University of the South Pacific provides a mechanism to help identify students who lack mathematical skill. This research will identify the effectiveness of OMDT to the student doing MA111 and FM101 unit in the first year. This was done by conducting survey based on observation of Coursework marks and the OMDT Results of the students.

After the data analysis, relationship between MA111 Coursework together with OMDT Mark and Modules, the result shows there is positive relationship of doing OMDT and the performance of students doing mathematics courses MA111. For non-science students their performance relationship between FM101 (Financial Mathematic) and OMDT also shows positive relationship. OMDT is a reliable way to improve mathematics knowledge in the first year university students.