From where do our students come?

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Mathematics Education Support Hub (MESH)
Western Sydney University
MESH

Provides numeracy, mathematics and statistics support to students of Western Sydney University.

Face to face provision on six campuses includes:

- Unit (subject) specific workshops, fourteen units in 2016
- Library roving
Research conducted by MESH indicates that as the level of MESH workshop support increases, the student average mark increases.
Proportion of students attending workshops in 2016

Workshop Participation by Support Level 2016 All Students

<table>
<thead>
<tr>
<th>Support Level</th>
<th>AoC</th>
<th>BioMec</th>
<th>Biom</th>
<th>DM</th>
<th>M1A</th>
<th>M1B</th>
<th>MFE1</th>
<th>MFE2</th>
<th>MFeP</th>
<th>MID</th>
<th>QT</th>
<th>SDM</th>
<th>SfB</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>4</td>
<td>4</td>
<td>15</td>
<td>13</td>
<td>13</td>
<td>6</td>
<td>39</td>
<td>101</td>
<td>60</td>
<td>2</td>
<td>19</td>
<td>16</td>
<td>123</td>
</tr>
<tr>
<td>Low</td>
<td>16</td>
<td>15</td>
<td>42</td>
<td>22</td>
<td>22</td>
<td>6</td>
<td>77</td>
<td>66</td>
<td>205</td>
<td>19</td>
<td>97</td>
<td>33</td>
<td>266</td>
</tr>
<tr>
<td>None</td>
<td>29</td>
<td>303</td>
<td>132</td>
<td>125</td>
<td>108</td>
<td>23</td>
<td>284</td>
<td>197</td>
<td>154</td>
<td>38</td>
<td>615</td>
<td>198</td>
<td>1211</td>
</tr>
</tbody>
</table>
Mathematics background of students in the subjects where MESH workshops are conducted

<table>
<thead>
<tr>
<th>Year and Support Level</th>
<th>High School Maths Level</th>
<th>2015</th>
<th>2015 Total</th>
<th>2016</th>
<th>2016 Total</th>
<th>2017 (Autumn Semester Only)</th>
<th>2017 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>34.47%</td>
<td>26.43%</td>
<td>53.29%</td>
<td>21.26%</td>
<td>54.13%</td>
<td>11.19%</td>
</tr>
<tr>
<td></td>
<td>Basic Maths</td>
<td>26.43%</td>
<td>25.75%</td>
<td>21.26%</td>
<td>18.26%</td>
<td>11.19%</td>
<td>22.38%</td>
</tr>
<tr>
<td></td>
<td>Int Maths</td>
<td>25.75%</td>
<td>13.35%</td>
<td>18.26%</td>
<td>7.19%</td>
<td>22.38%</td>
<td>12.30%</td>
</tr>
<tr>
<td></td>
<td>Advanced Maths</td>
<td>13.35%</td>
<td>100.00%</td>
<td>7.19%</td>
<td>100.00%</td>
<td>12.30%</td>
<td>100.00%</td>
</tr>
<tr>
<td></td>
<td>Grand Total</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Are the No Sr HS Maths group driven by mature entry students?

Number of students by
- Mathematics background
- current or non-current school leaver
- MESH workshop support level

![Bar chart showing the number of students by support level and course level.](image)
Average final exam marks of students by
• Mathematics background
• current or non-current school leaver
• MESH workshop support level
Statistics for Business

Average final mark

Number of students

Support Level
- High
- Low
- None
The Engineering suite
Mathematics for Engineers Preliminary

Average final mark

Number of students
Mathematics for Engineers 1

Average final mark

Number of students

Support Level
- High
- Low
- None

Current School Leaver (CSL)... Maths Background2
Progression (or not) through engineering mathematics subjects

Mathematics for Engineers 1

Autumn 2016

Spring 2016

Mathematics for Engineers 2

Spring 2016

Autumn 2016
Conclusions

• The overall profile of the current school leavers and non current school leavers in the business and engineering subjects is not in line with our assumptions.

• The mathematics background for current school leavers is predominantly, no senior high school mathematics.

• The mathematics background for non current school leavers is mostly, basic senior high school mathematics.

• As expected, from previous research, students who attended a high level of workshop support, on average, obtained a higher grade than those who did not attend MESH workshops or only used low level support.
Conclusions

- **The profile of students studying statistics for business**
  - The cohort is made up of predominantly current school leavers with no senior mathematics.
  - For students with no senior high school mathematics or basic senior high school mathematics - NCSL, on average, did not perform as well as CSL.
  - Despite the high proportion of students with no senior high school mathematics, on average, all mathematical background groups achieved a final mark more than 50%.
  - Students attending MESH workshops, on average, achieved a higher final mark than those who did not attend.
Conclusions

• The profile of students studying engineering mathematics units

  • The high proportion of current school leavers with no senior high school mathematics is repeated in the initial engineering mathematics subject, Mathematics for Engineers Preliminary. In fact this is group make up 53.5% of the cohort

  • On average none of this group achieve 50%, although the final marks for students who attended MESH workshops are higher than those who did not attend.

  • The second largest group in the cohort are current school leavers with an intermediate school maths background,

    • On average only students, in this group, who made use of support, achieved more than 50%

  • THIS IS AN ISSUE
Future Directions

• What can we do to improve the chances of success for students, entering engineering, with no senior high school mathematics?

• How can this data be used to generate better models for student retention (at least for students studying a maths/stats unit)?