Irish Maths Teachers Association Survey 2012
Analysis on the survey results undertaken in July 2012
Introduction

The creation of skilled mathematics graduates at secondary school level in Ireland is currently of national importance. The jobs of tomorrow, indeed the jobs of today, require graduates to have a high appreciation of mathematics which is somewhat at odds with students’ attitude to this wonderful stimulating subject.

Up to 2011 student numbers taking the higher level paper had been falling yearly and Engineers Ireland believes that everyone must take the responsibility to ensure that more Irish leaving certificate graduates sit the higher level maths paper to protect their future career prospects whatever direction their job path takes them.

This is a situation that no one can ignore. We all have a duty to improve the standards of our students in Ireland. This responsibility falls to everyone, from the students themselves, their parents and their teachers to Irish industry and the government.

Engineers Ireland plays its part to ensure that students and teachers develop a better understanding of the topic and develop an appreciation for this essential life skill.

In February 2010 Engineers Ireland released a document entitled Report of Task Force on Education of Mathematics and Science at Second Level. In March 2010 Engineers Ireland launched its free higher level leaving certificate maths tutorial initiative in Dublin. In September 2012, due to demand, this initiative has been extended to Cork and Galway also. Through our education outreach programme STEPS we have developed Project Maths worksheets and training materials in partnership with NCE-MSTL to support maths teachers. We also provide volunteer engineers who visit schools to highlight the benefits of maths, that is not only important to an engineering career but to all careers.

Engineers Ireland believes that by producing more graduates with higher level maths ability, we are protecting the future skills of Ireland Inc and directly playing a part in Ireland’s future job creation prospects.
Maths Teachers Survey Methodology

The Engineers Ireland Maths Teachers Survey was carried out in conjunction with the Irish Maths Teachers Association (IMTA). The online survey link was distributed to 800 members of the IMTA who had an active email address on Tuesday 31st July 2012 and when the survey closed at midnight on Monday 6th August 2012 301 people had started the survey and the valid responses totalled 253.

Background

On the 15th August 2012, the State Examinations Commission confirmed that a record number of 11,131 students sat the higher level leaving cert paper across Ireland up on the previous year’s number of 8,237.

This was the first year of the re-introduction of 25 bonus points to any student who achieved a D3 or higher in the 2012 higher level leaving cert maths paper.

Project Maths was first introduced into 24 pilot schools in September 2010 at 1st year and 5th year level with the leaving cert students sitting the first Project Maths exam in June 2012. Students sitting the Leaving Certificate in other schools nationwide were only examined on two strands of the syllabus. In June 2013, all students will be examined under the new Project Maths syllabus.
Survey Results

Q Do you think maths education should be given greater priority in the teaching curriculum than it currently is to support the future skills needs of our economy?

Yes – 84%
No – 16%

Q Should there be more focus on maths at Junior Cycle to help student achievement in the subject?

Q Do you believe the introduction of Project Maths will improve achievement in the subject?
Against the new Project Maths course

57.5% of teachers believe that changes to the curriculum will not improve achievement in the subject. When asked for the reasons behind their answer, responses included that mathematics is being “dumbed down” and the language used in questions is “too wordy” putting pressure on the weaker students. Other complaints included lack of resources for teachers, standard of past papers and “too much statistics”.

However the most common concern amongst the maths teachers was that the new course is longer and is being delivered in the old time frame. This increases the pressure on teachers to ensure smooth roll out of the subject amongst a cohort who themselves were unsure of the new changes to the curriculum. Teachers cited the lack of in-depth teacher training on the new curriculum, with many believing that Project Maths should have been introduced in first year of secondary school so that both student and teacher would be able to develop and understand the changes over the duration of the students’ time at second level. In the past academic year confusion seemed to reign amongst students and their teachers. One added “We, the teachers need more help with the new curriculum as Project Maths depends on us to make it succeed” whilst another wrote “I wanted to answer yes and no! I like the methodologies but it needs more materials, inservices (sic) and better information about exam papers”.

Project Maths Supporters

The 42.5% of teachers who believe that the introduction of the new syllabus would be of a great benefit to the students felt that they were beginning to deviate from rote learning to more emphasis on the understanding behind the maths problems. The respondents felt that students were beginning to see the practical applications in the topic which makes it more interesting for the student in the classroom and therefore improves participation in the class on which one teacher offered "Project maths makes students use maths in everyday problems, thus helping them see the point in doing such maths in school". They believe that once student enjoyment in the topic is increased, their ability to perform in the exam will increase. One teacher emphasised that “Project maths has increased the emphasis on the understanding the maths over the previous syllabus that emphasised doing the maths”.

This group also believes that their fellow maths teachers will also benefit from the new syllabus as it has challenged them to increase their knowledge and improve their teaching skills with one saying “Teachers have to reflect on how they are presenting lessons more now than before”.

What is clear between both groups is that the majority of teachers feel that the course should have been introduced in first year only and that the school timetable has to be adjusted to allocate more class time to the subject as the course has become longer.
**Bonus Points**

Q Do you think bonus points for higher level maths in the Leaving Cert has made a difference this year?

**Yes** – I have seen a definite improvement in results throughout the academic year 3.2%

**Yes** – it has increased the number of students in my school sitting the higher level maths paper. 54.1%

**No** – I have not seen any difference 16.6%

**Other** – 26.1%

On the issue of the re-introduction of 25 bonus points available to students who at a minimum, pass their higher level paper, respondents saw an increase in the number of students in their school sitting the higher level paper, a further 17% said they have seen no improvement whilst only 3% saw a definite improvement in results throughout the academic year. The final 26% who offered feedback revealed that they are against the idea of bonus points as it is asking students who do not have the ability to persist with higher level maths which affects the progress of the rest of the class.

Q Do you agree that your students would benefit if maths teaching in schools was combined with industrial visits to view real-life application of maths?

**Agree** – 75.2%

**Disagree** – 11%

**Other** 13.8%

In this instance, the respondents who chose “other” reflected that they were hampered in this instance to introduce such fieldtrips due to the length of course and the recent cutbacks with regards to school trips. Most teachers seem to agree that such initiative should happen in transition year when time was on the students’ side as opposed to the constraints in 5th and 6th year.

**Technology in the classroom**

Q Do you think the increasing use of technology in the classroom will help student achievement in maths?

**Yes** - 56.3%

**No** - 14.4%

**Don’t know** - 13.4%

**Other** – 15.9%

A small majority of teachers believe that increasing the use of technology in the classroom will benefit students; those who are against it or who did not know enough about the supposed benefits state whilst it may work, it should merely be an add-on as they believe students still need to put the effort and application in to the understanding of maths in the classroom before the technology is introduced. “Technology is fine provided the basic concepts and understanding of the core maths ideas, values and methods are understood and utilisable by the students first.
Pressures outside the classroom

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<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>The pressure from parents on their child to achieve high grades in maths is huge</td>
<td>25.6%</td>
<td>45.1%</td>
<td>27.1%</td>
<td>2.2%</td>
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<td>There is increasing pressure from my principal to produce results in maths students</td>
<td>16.1%</td>
<td>36.6%</td>
<td>40.3%</td>
<td>7%</td>
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<td>Extra maths tuition outside the classroom is required</td>
<td>15%</td>
<td>28.9%</td>
<td>46.9%</td>
<td>9.2%</td>
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<td>Extra maths tuition outside the classroom has become the cultural norm</td>
<td>39.9%</td>
<td>49.5%</td>
<td>10.3%</td>
<td>0.4%</td>
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Classification of respondents

Of the 253 maths teachers who completed the survey 75% of the respondents were in possession of a **primary degree in mathematics**, with 25% saying that their primary degree was not in mathematics. A further 10% of this group furthered their education to acquire a **Masters in mathematics**.
Conclusion

The response of the maths teachers to the new Project Maths curriculum is not surprising as it is still very early days in its introduction and like any change, it will take some years to fully bed down. What is encouraging is that the teachers recognise that the new curriculum is a step in the right direction towards learning focused on problem solving rather than rote learning.

A clearly identifiable trend is that time is an issue for the teachers in terms of delivering the syllabus within the constraints of the current scheduling of maths classes in the traditional timetable model. Clearly some teachers also felt that prioritising time for continuing professional development is a concern also.

Almost three quarters believe that industry does have a role to play in assisting with the delivery of the Project Maths curriculum but the lack of resources available within schools means that field trips are a nice to have rather than a need to have at this juncture in Ireland’s economic recovery.

Engineers Ireland believes that it has a role to play in supporting the teachers in the delivery of the new curriculum by continuing to raise awareness of our online support materials for teachers to use in the classroom through our STEPS programme.

And perhaps more importantly, by facilitating the industrial visits where teachers are unable to bring their pupils to industry, Engineers Ireland through its hundreds of volunteers around the country can bring industry to the classroom.