

Department of Education and Science - Statement of Strategy 2008 – 2010
STEPS to engineering Submission

Introduction

STEPS to engineering, established in 2000, aims to encourage primary and post primary students to explore the world of science and engineering, and to raise awareness about the exciting challenges and opportunities presented by a career in science and engineering.

The programme is managed by Engineers Ireland and is supported by the Department of Education & Science, Forfás, (through the Discover Science and Engineering programme), FÁS and 21 industry representatives.

The development of the **STEPS to engineering** programme is a key part of Engineers Ireland's "Promoting the Profession" initiative. Engineers Ireland, formerly the Institution of Engineers of Ireland, is one of the largest professional bodies in the country, with over 23,000 members. The primary role of Engineers Ireland is to be the representative voice of the engineering profession in Ireland and to increase the number of engineers on the island, which is vital to maintaining continued economic success and promoting a knowledge society.

The overall aims of STEPS to engineering are to:

- Raise awareness amongst students about engineering as a career choice;
- Encourage a positive attitude towards careers in engineering, science and technology;
- Promote a greater understanding of the role/contribution of engineering in society and how engineering is relevant to our everyday lives;
- Highlight the advantages, diversity, opportunities and excellent rewards offered by a career in the engineering profession, and
- Introduce students to science subjects and demonstrate the links with engineering

In December 2005, the Minister for Education and Science Mary Hanafin presided at an event to announce the re- branding of the **STEPS to engineering** Programme, formerly known as the STEPS (Science Technology Engineering Programme for Schools). The aim of this exercise for **STEPS to engineering** was to help students make the connection between the programme and the engineering profession.

In 2006, the value of the programme was formally recognised by the Department of Enterprise Trade and Employment when **STEPS to engineering** became a strategic partner of the National "Discover Science & Engineering" programme. Its programme of activities was doubled in the same year.

The support of the Department of Enterprise, Trade and Employment, and the Department of Education and Science, is essential for the success of the **STEPS to engineering** programme. We are delighted that President Mary McAleese has again agreed to be our patron. The success of the **STEPS to engineering** programme has also been recognised in Europe and presented at the FEANI, European Engineers Forum in 2007.

Economic Importance

Many studies (The ROSE Report, Expert Group on Future Skills, The Task Force on the Physical Sciences, Engineering a Knowledge Island 2020) have highlighted a worrying decline in young people's interest in science and engineering as a career choice in Ireland and globally.

It is of critical importance that we reverse this trend and increase the number of students studying the physical sciences for Leaving Certificate, and pursuing engineering and science courses at third level.

The availability of sufficient well educated/trained professional engineers in multidisciplinary areas is key to achieving the Lisbon Agenda of enabling Europe to become a Knowledge Economy.

Investment in science and technology is now firmly embedded in Irish economic policy. The recommendations implemented from The Technology Foresight Group demonstrated the Irish Government's strong commitment to R&D in 2000, and this has developed as a key Government strategy since then. This was supported by the recommendations of the Task Force of the Physical Sciences which is making a great contribution to science education research in Ireland. The Strategy for Science, Technology and Innovation 2006 – 2013 again highlights the importance of this area for the Irish Economy.

A recent report entitled "*Engineering a Knowledge Island 2020*", published by Engineers Ireland and the Irish Academy of Engineers, highlighted that if the island of Ireland is to become a top five global economy by 2020 there needs to be a year on year increase of 7% in the number of engineering graduates. Ensuring the continued support and continuation of the **STEPS to engineering** programme is a critical success factor in achieving this.

Hence, we must persist with science and engineering awareness programmes. A further issue is the decline in the number of students sitting the Leaving Certificate over the coming years. It is essential therefore to continue to provide support to the primary and secondary schools, through supporting the curriculum with activities and providing literature on the variety of careers in engineering.

Furthermore, engineering in Ireland is about to undergo a period of very significant change which will bring Irish engineering education in line with European education standards under the Bologna Declaration. Communicating this to students, parents and teachers is essential.

STEPS to engineering Activities

In the 2007-08 school year, the **STEPS to engineering** programme is actively encouraging young people to consider a career in engineering through 1,500 events targeting over 65,000 students nationwide.

Primary School Activities

Our primary school activities are focused on the pedagogy of inquiry-based learning which enables students of all levels to engage with our projects and which is consistent with European recommendations in science education. The particular benefit of this type of learning is that it has proved to be beneficial when promoting girls' interest and participation in science activities, which is a key focus for the economy going forward. It has also been demonstrated that positive contact with science and technology at an early age can have a long-lasting impact.

The **STEPS to engineering** K'NEX challenge began in 2003 with 15 primary schools involved. We now have 750 schools and 28,000 primary school pupils taking part in this activity annually which is closely linked with the design and build element of the SESE curriculum. This project is managed and coordinated by the **STEPS to engineering** team and supported by the Hasbro Company. This project involves a volunteer engineer visiting a local primary school to talk about engineering, and also a construction challenge, highlighting that engineers are involved with designing new products, working in teams and working towards project goals.

A new project, the **STEPS to engineering** K'NEXperience, has been introduced this year with 700 schools and 19,000 primary school pupils taking part throughout Ireland. This is a project-based K'NEX challenge where the class are invited to visit a local engineering feat, draw a design of this, build it using the K'NEX toys provided, and submit a project on their experience. This project emphasises the importance of cross-curricular learning and integrating science into other subjects.

The **STEPS to engineering** Magical Science and Engineering Show is an interactive demonstration-type lecture show. It aims to create a positive attitude to science before students enter post-primary school and is again closely linked and developed in line with the SESE Curriculum. This show will travel to 22 venues nationwide in 2007-08 and reach approximately 15,000 primary school pupils. Lesson Plans have been developed in 2007 to further assist the teachers in delivering the SESE curriculum in the classroom and teacher training will also be provided.

All our primary school activities allow schools to earn points towards the DSE "Discover Primary Science Awards", a result of the further integration between the DSE and **STEPS to engineering** awareness programmes.

Post Primary School Activities

The Engineering and Technology Champions Programme is a collaborative programme run by **STEPS to engineering** and ICT Ireland. This involves young graduate engineers visiting a local secondary school to talk to students about engineering in an environment where students feel comfortable asking questions; 550 secondary schools will take part in this programme in 2007.

The “Engineering as a Career” Student Seminars take place in third level colleges throughout Ireland and provide students with the opportunity to visit their local institutes of technology, or university, and learn about careers in engineering. The seminars are open to teachers, parents and pre-Leaving Certificate students, and aim to introduce engineering as a career to students and help the audience differentiate between the various disciplines of engineering.

STEPS to engineering also led an ICT Campaign called “*Are you up for it?*” from late 2006 to early 2007. This was managed and coordinated by **STEPS to engineering** in conjunction with DSE, ICT Ireland, the Irish Computer Society and the HEA. This group came together in response to a call from both industry and third level institutions to urgently tackle the significant and continuous decrease in the numbers entering ICT courses. The campaign involved a mixture of online and radio advertising resulting in the target audience logging on to an interactive website. This was the first significant move for STEPS to engineering into the advertising world. This campaign also illustrated the importance of partnering with groups active in the awareness area to achieve maximum outcome. This campaign resulted in an increase in students applying for computing courses through the CAO system in 2007.

STEPS to engineering is hoping to build on the experience gained and lessons learned from the “*Are you up for it?*” Campaign and are currently in talks with the Universities and Institutes of Technology regarding the development of a National Promotional Campaign for Engineering. This would involve advertising to the target audience of 16-18 year old students using radio, online, TV, cinema and outdoor advertising and will be run over a three year period.

The first ever Engineering Week (Engineered! A Week of Wonder) took place from the 19th – 23rd of February 2007. Activities intended to make engineering relevant and exciting to children were held in partnership with City and County Councils, Institutes of Technologies, Universities, engineering firms, education and outreach centres, libraries and local businesses. Over 11,400 attendees took part in 75 events around the country. A critical success factor of this week was that 33% of the attendees were parents who are key influencers in guiding students’ choices both in subject choice and career choice.

STEPS to engineering and DSE will host a “Science & Engineering Communication and Awareness” conference in May 2008 to facilitate all organisations involved in this awareness industry and to ensure joined up thinking and maximize the collaboration and partnering of all organisations involved in promoting science and engineering.

To support all of our activities, **STEPS to engineering** provides students, teachers and parents with a wide range of publications to inform them about engineering as a career. These include Engineering Life, Engineering Your Career Book, career sheets and our website www.steps.ie.

Strategic Direction

It is essential for the long term development of the programme, and the continuation and strengthening of the strategic partnership with DSE, that longer term funding can be secured for the **STEPS to engineering** programme. To further facilitate better planning, resourcing and delivery our intention is to develop proposals for a seven year funding programme and would welcome a discussion with you on this.

Evaluation and forward planning is a key focus for the **STEPS to engineering** team. We have recently completed our new strategic plan for 2008-2010 and are anxious to secure funding in order to ensure that we can continue to meet the needs of our students, teachers and general public, and continue providing them with comprehensive and accurate information about the dynamic opportunities available to graduates in the engineering sector.

As a strategic partner of DSE, quarterly reports on our programme activities and annual reports on each activity, are submitted to highlight our progress against our KPI'S and financial objectives.

Longer term funding will enable the programme to execute our strategic plan, and ensure that we can maximise efficiencies, and provide overall value for money to the Department of Education and Science. This will also enable us to retain key members of the team with longer-term contracts and reduce the possibility of them seeking longer-term employment elsewhere.

As strategic partners of the Government's Discover Science and Engineering Programme, **STEPS to engineering** will undergo an external evaluation in 2008, which will again enable us to review our programme and ensure that we are providing our target audiences with relevant activities and information. We strongly welcome this planned international benchmarking evaluation by Forfas, on behalf of the Department of Enterprise Trade and Employment. This, coupled with internal evaluation and benchmarking against European initiatives will ensure that **STEPS to engineering** continues to develop a programme of activities that will generate real results and increase the number of students studying engineering at third level.

Thank you for this opportunity to submit this proposal for the Department of Education and Science Statement of Strategy, 2008-2010.