Forfás and EGFSN submission to the Draft National Plan to Improve Literacy and Numeracy in Schools
Forfás is Ireland’s policy advisory board for enterprise, trade, science, technology and innovation.

The Expert Group on Future Skills Needs (EGFSN) advises the Irish Government on current and future skills needs of the economy and on other labour market issues that impact on Ireland’s enterprise and employment growth. It has a central role in ensuring that labour market needs for skilled workers are anticipated and met. Forfás provides research, analysis and secretariat support to the Expert Group on Future Skills Needs.

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Summary of priorities

- Ensure that the Strategy highlights the clear link between literacy and numeracy skills and their importance in the workplace, not only for underpinning basic or generic skills but also for encouraging students in to highly skilled occupations in a range of sectors.

- The emphasis the Draft Plan places on integration of literacy and numeracy with other subjects is most welcome and has proved highly effective for adult learners that engage in upskilling. The application of literacy and numeracy to ‘real life’ examples and problems is a recurring theme that emerges from EGFSN reports.

- Forfás and the EGFSN strongly endorse the draft strategy proposals for more frequent assessment and more effective use of assessment data. In parallel, it is also important to regularly benchmark and evaluate teaching practices based on Irish and international best practice in areas such as curricula, instruction, materials, and use of technology.

- Forfás and the EGFSN strongly support the prominence of continuing professional development and upskilling for practitioners throughout the school system in the Draft National Plan. It is important that CPD and upskilling options are made available on a flexible basis in order to maximise participation.

Introduction

Forfás and the Expert Group on Future Skills Needs (EGFSN) welcome this opportunity to make a submission to the National Plan to Improve Literacy and Numeracy in Schools (hereafter referred to in this submission as the Draft National Plan). At a time of unprecedented challenges in our economy and labour market, the importance of literacy and numeracy skills from an enterprise perspective cannot be understated. Unless we get the very fundamentals right in educating our young people, there is a real threat to our enterprises’ ability to compete in world markets and for individuals to secure employment. Drawing from the findings of various Expert Group and Forfás reports, this submission concentrates on the importance of literacy and numeracy from the perspective of the skills needs of enterprise in the 21st Century workplace.

The world of work may seem a world away for most young people. Yet, where basic skills such as literacy and numeracy have not been developed from an early age, people can be hindered from fully accessing education and training opportunities or the labour market in later life. This inhibits individuals from realising their potential, which also has wider costs for the economy and society. Literacy and numeracy skills are important as new technologies and modes of doing business bring with them higher skills requirements, even in occupations traditionally considered ‘low skilled’. This is within the context of current high unemployment, where many people that have lost their jobs will have to upskill or reskill to other sectors in order to re-enter the labour market.

The need for good literacy (including technological literacy) and numeracy skills is a recurring theme in the reports of the EGFSN. Increasing skills requirements arise in a number of ways. The National Skills Strategy highlighted how virtually all occupations are becoming more knowledge-
based, requiring an increasing breath of knowledge, rising technical, qualification, and regulatory
requirements and continual learning. Globalisation is continuing apace, human capital has become
highly mobile and world competition for skills in areas such as ICT and Life Sciences remains intense
despite the downturn. The proliferation of new and emerging technologies requires continuous
responsiveness to capitalise on their potential.

The ability to respond and manage these drivers of change is important in order for Irish-based
companies to compete in world markets. Educated and skilled employees are a crucial part of our
companies’ competitiveness. Generic skills, including literacy and numeracy, are required in
virtually all roles in the modern workplace. This submission focuses on the importance of literacy
and numeracy to enterprise and the workplace from the following perspectives:

• The rising importance of generic, basic skills and minimum qualification requirements across
  occupations;
• The importance of raising national mathematical achievement from an economic and enterprise
  point of view; and
• Rising skills requirements within sectors identified by the EGFSN (for example, ICT, Bio-
  pharma/Pharmacem, Financial Services, the Green Economy, Retail and Healthcare),
  particularly in low skilled occupations.

1. The rising importance of generic, basic skills and minimum qualification
requirements across occupations

Virtually all sectors of industry are becoming more knowledge-intensive, in the very broad sense of
the term. This involves a change in the types of skills required, with a rise in the importance of
generic skills, including the ability of individuals to work more autonomously; be self-managing,
work as part of flexible teams, adapt to change, solve complex problems, think creatively and
engage with innovation as a continuous process.

Regardless of how the ‘knowledge economy’ develops, there is a widely shared assumption that
there will continue to be demand for relatively low skilled workers, the main difference being that
now they will increasingly be employed in services that require a relatively greater emphasis on
generic-type skills. There is also evidence to suggest that the kinds of higher-level jobs more
generally associated with a knowledge economy are also requiring proportionately more skills of a
generic nature. Generic skills are now regarded as of at least, if not more, importance for
employers as technical or job-specific skills for the 21st century workplace.1

Based on the national and international academic evidence available, the Expert Group has
identified in the National Skills Strategy the key and most widely shared elements that should be
included in a generic skills portfolio as:

• Basic/fundamental skills — such as literacy, using numbers, using technology;

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1 For further information on the role of generic skills within enterprise, see the National Skills Strategy background paper The Changing Nature of
- People-related skills — such as communication, interpersonal, team-working, customer-service skills; and
- Conceptual/thinking skills — such as collecting and organising information, problem-solving, planning and organising, learning-to-learn skills, innovation and creative skills.²

The variety of levels and intensity with which any of these skills might be required will vary, depending on the job. Furthermore, other skills such as scientific literacy, enterprise skills (such as management skills, sales and marketing and, increasingly, foreign language skills) and possibly broader citizenship skills might also be included in any essential generic skills set.

Literacy and numeracy capabilities underpin the generic skills portfolio as outlined above. The Draft National Plan highlights that modern literacy extends beyond the traditional view as the skills of reading and writing to include the capacity to read, understand and critically appreciate various forms of communication including spoken language, print, broadcast media, and digital media. These skills are integral to generic skills required in the modern workplace such as reading, writing, technological literacy, communication, interpersonal and team-working skills which cannot be developed without developing the fundamental capabilities encompassed by the modern definition of literacy.

Similarly, the modern interpretation of numeracy not only includes the ability to use numbers but the wider ability to use mathematics to solve problems and meet the demands of day-to-day living. In this context, numeracy also provides the basis for many of the generic skills required by employers in the 21st century workplace such as using numbers, organising and analysing information and problem-solving.

Other factors such as regulatory requirements and technology are increasing and diversifying the minimum competencies required to be employed in many occupations, even those traditionally considered ‘low skilled’.³ These include minimum mandatory qualifications or rising industry standards required in occupations such as childcare, health assistant roles, security, construction and health and safety. For example, the Draft National Plan references the requirement that all pre-school leaders will have to have a minimum of an NFQ Level 5 qualification in childcare and education by 2012. The EGFSN report Workforce Planning in Healthcare highlighted that where mandatory minimum qualifications are introduced for occupations such as home help or health care assistant roles, there could be a significant impact on supply.⁴ In relation to technological impacts, reduced cash transactions in many services have transformed the role of the cashier to one where technological literacy and greater engagement with customers have now become basic tasks of that occupation. Many people without basic literacy and numeracy skills that would have in the past been employed in these sectors may find themselves prohibited from access to these types of occupations.

² EGFSN (2007) Tomorrow’s Skills – Towards a National Skills Strategy
Wider benefits of developing literacy and numeracy, in a workplace context, include greater ability to work autonomously (through greater problem-solving abilities) and as part of teams (through good communication and interpersonal skills). It is essential that these core skills are developed by the education and training system from an early age and that the connections between literacy and numeracy and the workplace and society are communicated to children and parents in order that they can understand their critical nature.

2. The importance of raising national mathematical achievement from an economic and enterprise point of view

Ireland must raise its level of mathematical achievement to ensure it will continue to successfully compete with other economies. An adequate supply of people with mathematical, science and ICT skills is crucial to Ireland’s future social and economic development. Mathematics is important because it underpins many other disciplines such as science, technology, business and finance. It is a fundamental requirement for the growth of the knowledge economy and the development of a world-class research and innovation system in Ireland. Mathematical skills are essential for enabling people to fully participate and work in a modern society. Improving national mathematical achievement is therefore vital for all of us.

In December 2008, the EGFSN published its statement on Raising National Mathematical Achievement, which highlighted that the current level of our mathematical achievement is of serious concern to employers. Mathematical concepts, models and techniques are central to working in all sectors of employment and are equally important to services jobs as to manufacturing jobs. The proficiency level of students in mathematics is a key factor influencing the domestic supply of graduates for sectors with growth potential such as ICT, Life Sciences and Business, Financial and Professional Services. Boosting the level of our mathematical capability would help ensure opportunities for employment growth could be fully realised.

Mathematical proficiency is not limited only to high-skilled jobs. Workers in low and medium skilled level jobs also require at least basic mathematical proficiency - for example, the ability of retail workers to function effectively when engaged in tasks involving numbers e.g. sales transactions, stocktaking, and product layout. In order to foster a knowledge-based economy, business is calling for radical measures to boost the numbers of students performing well in Higher-Level Leaving Certificate Mathematics and to increase overall national mathematical proficiency. The main challenges facing Ireland becoming one of the top OECD countries in terms of mathematical performance are the need to: (i) improve the quality and level of mathematical knowledge outcomes for all; (ii) increase the number of students achieving at the highest proficiency level; and (iii) reduce the numbers of students achieving at the lowest proficiency level.

Forfás and the EGFSN endorse a number of the proposals laid out in the Draft National Plan and would prioritise the following with regard to improving numeracy and mathematical achievement:

- The target in the Draft National Plan to “increase the percentage of students taking higher level mathematics at the end of the junior cycle to 60 percent by 2020” is welcome. The

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5 EGFSN (2008) Statement on Raising National Mathematical Achievement
EGFSN Maths Statement proposed encouraging more Leaving Cert students (particularly females), to take Higher Level Maths - in line with current NCCA targets of 60 percent at Junior Certificate and 30 percent at Leaving Certificate - thereby boosting the potential pool of students for Science, Engineering, Technology and Business subjects at third-level. The focus should be on encouraging those capable of achieving A1 and A2 grades in Ordinary Level Maths to move up to Higher-Level and addressing the cohort of Leaving Certificate students that drop down from Higher Level to Ordinary Level maths within the Leaving Certificate cycle.

- The Draft National Plan places a significant emphasis on Continuing Professional Development at both primary and secondary levels. This is also highly supported by Forfás and the EGFSN, which recommended that Professional Masters Degree Courses focussed on “academic mathematics”, should be introduced for primary teachers. The EGFSN Statement on Mathematics also proposed Professional Masters Degree and Higher Diploma in Mathematical Education should be developed and that consideration should be given to the introduction of a 4 year honour degree programme in Mathematical Education.

- Forfás and the EGFSN also highly support the Draft National Plan proposal to continue the development and roll out of Project Maths. The more interactive approach to teaching mathematics within Project Maths should be supported. This includes students engaging in discussing real world/business problems and how mathematics might be applied to solve them. Problem solving, critical thinking and logical reasoning should be encouraged.

- Greater support should be given to helping weaker pupils with their maths at primary level. Such early intervention could help reduce the significant numbers of those who go on to fail maths in the Leaving Cert. The transition from primary to second-level maths learning could be significantly improved. A bridging framework should be developed to ensure that learning at primary level is built upon in early second-level. This would include primary school and secondary school maths teachers meeting to discuss how a pupil’s progress could be supported between sixth class at primary level to first year at second-level. Work in this area which is currently being developed under Project Maths should be supported.

- There should be an improved continuity in mathematical studies in Transition Year programmes. The lack of continuity in mathematical studies and regular homework at this crucial age should be addressed. Sufficient time should be given to the teaching of mathematics at second-level particularly in the Junior Cycle.

- Forfás and the EGFSN also strongly support the significant role placed on parents in the development of literacy and numeracy. The EGFSN statement on Mathematics highlighted that parents have a key role to play in encouraging their children’s engagement in mathematics education from pre-school age to second-level. This role, however, can be limited by the fact that many parents do not feel proficient in the mathematics curriculum. Indeed some may have negative impressions of the subject based upon their own experiences.

- Concise written and web-based material aimed at enhancing the parent’s role in encouraging and supporting their child’s mathematics learning should be developed. Schools could also provide parents with short instruction sessions on appropriate level mathematical concepts and learning. The Washington State Guide for students and parents “Got Math? Multiply your options for the Future” brochure is a good example of such promotional material.

- Forfás and the EGFSN strongly endorse the need for better assessment data outlined in the Draft National Plan. The EGFSN Statement on Mathematics proposed that an ongoing research programme is required to benchmark and evaluate Ireland’s mathematical performance in an
international context. Results could then be compared annually against an agreed range of national targets set for national mathematical achievement. Such a programme could measure progress and report upon best practice experiences - Irish and international - in curricula, instruction, materials, use of technology, assessments, professional development of teachers etc. Work already undertaken by the NCCA, the State Examination Commission and the Educational Research Centre could usefully be built upon. This research would inform policy and practice. Findings could be used to frame a promotional campaign aimed at increasing interest and knowledge of mathematics education among students, teachers and parents.

3. Rising skills requirements within sectors identified by the EGFSN, particularly in low skilled occupations.

The need to develop literacy and numeracy skills in the workplace is a recurring theme emerging from sectoral reports of the EGFSN. Without these basis skills, many employees may not be able to engage in the upskilling necessary to retain their employment, move to the next level in their careers’ or participate at appropriate levels of education and training. In addition, factors such as new technologies, regulations and more efficient work practices raise the minimum skills requirements even for jobs that were perhaps considered as relatively basic in the past. This highlights how deficiencies in basic literacy and numeracy impact at a highly practical level on individuals in the workplace. The figure below from the recent Forfás publication Making it Happen - Growing Enterprise for Ireland highlights the range of sectors in the Irish economy, which all have a diverse breadth of skills requirements.

Literacy and numeracy skills are essential across all of these sectors, even mature sectors such as tourism and hospitality, where what may be considered relatively simple tasks such as taking food and drink orders, communicating with customers, adding up bills and processing transactions all require basic literacy and numeracy skills. At the other extreme, despite the current labour market downturn, shortages in occupations such as computer programming and design engineering persist. These types of occupations highly depend on the development of literacy (including technological literacy) and numeracy from an early age in order to ensure a sufficient skills pipeline for these sectors.

Forfás and the EGFSN strongly endorse the Draft Plan objective that “all teachers should be teachers of literacy and numeracy”. There can be significant benefits from an integrated approach to literacy and numeracy. For example, the 2010 EGFSN report *Future Skills Needs of the Wholesale and Retail Sector* found that the educational profile of the wholesale and retail sector and interview evidence together point towards functional literacy and functional numeracy being a significant issue within the sector.⁶

Functional literacy refers to the ability to understand and use written information practically in the context of work and life, rather than an actual inability to read. This can be addressed in part through training interventions, both through the communications modules that form a part of many retail-related courses, and through “integrating literacy” throughout the course. Integrating literacy means designing and delivering education and training programmes in a way that is effective for adults who may not be confident in literacy generally and/or in the specific literacy demands of the particular programme. It involves particular methodologies on the part of the teacher or trainer, as well as whole-organisation systems that take account of literacy issues at every phase of education and training programmes and across the entire curriculum. These are outlined in the document “*Integrating Literacy - Guidelines for Further Education and Training Centres*” (NALA 2002).

Similarly, the 2009 EGFSN report on *Future Skills Requirements of the Food and Beverage Sector*, highlighted that a key concern of many of the Irish development agencies is the upskilling of those employees who lack basic skills and providing opportunities for further training.⁷ Within the food processing sector, particularly at an operative level, there are a significant number of employees who lack any formal qualifications, with the perception that basic skills such as literacy and numeracy are poor.

There is a concern that low literacy levels may be an underlying barrier in the Food and Beverage sector to engaging in formalised training, leaving individuals vulnerable if they were to become unemployed. The skill sets required at operative level within food and beverage manufacturing are rising. Due to greater efficiencies arising through new technologies and improved workplace practices, operatives increasingly need a broader based skills set that includes supervisory competencies and understanding of lean manufacturing practices and supply chain management. The report recommends the introduction of an accreditation programme for food operatives, with a

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⁶ EGFSN (2010) Future Skills Requirements of the Wholesale and Retail Sector
⁷ EGFSN (2009) Future Skills Requirements of the Food and Beverages Sector
focus on transferable skills including numeracy, literacy, basic IT, communication & interpersonal skills, team-working and English as a foreign language. The objective of this recommendation is to give recognition to the depth of knowledge associated with food operatives’ positions through accredited qualifications such that the status of operatives becomes recognised as one of being a qualified technician.

At higher occupational levels, shortages of science, engineering, technology and maths graduates and indeed less than adequate levels of mathematical proficiency more generally persist across a range of sectors (e.g. ICT, Biopharma, Pharmachem, Green Economy, and International Financial Services). Some reports of the EGFSN (Future Skills Needs of the ICT Sector; Future Skills Needs of Enterprise within the Green Economy) have specifically pointed to the low participation rate in higher level mathematics at leaving certificate as a major contributing factor. This relates directly to how maths is promoted, taught and prioritised within the school system. The issue extends as far back as Junior Certificate where, at 43 percent, higher level maths has one of the lowest higher level participation rates of all junior cert subjects.

The EGFSN report *Future Skills Requirements of the Bio-pharma/Pharmachem Sector* highlighted that the occupational profile of the sector is changing, with managers, professionals and associate professional/technical positions rising in relative importance to operatives as companies move to higher value added activities such as process and product development, and services such as supply-chain management and corporate services.\(^8\) Even at the operative/technician level, the basic skill sets required are increasing, with operatives now needing to be flexible and skilled in a number of areas, including information technology, analytical offline testing, mechanical changing of equipment, chemical engineering and chemistry. Operatives will also be required to work in teams and need to develop team-working skills.

The EGFSN report *Future Skills Needs of Enterprise within the Green Economy* underlined the need for improved mathematical proficiency at all skills levels.\(^9\) The view of companies is that while the mathematical proficiency requirement of the workplace has gone up, the proficiency levels of recruits has not improved in line with this. Staff must be more proficient in applying their mathematical knowledge in ‘real-life’ business situations - such as engineers calculating the commercial returns of a project, technicians and electricians analysing data from energy instrumentation and controlling devices or skilled workers providing advice to householders on economic returns arising from various energy efficient heating and lighting appliances. The report specifically recommended that ‘real life’ mathematical examples from business need to be incorporated into curricula. It also recommended that the numbers of students taking Higher Level Leaving Cert Maths needed to be increased and to develop mathematical knowledge skills modules at different NFQ levels to meet the upskilling needs of workers across occupations.

The 2008 EGFSN report on *Future Skills Need in the ICT sector* specifically pointed to the need to introduce CPD maths programmes for teachers in both primary and secondary and to introduce a

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\(^8\) EGFSN (2010) Future Skills Requirements of the Bio-pharma - Pharmachem Sector

\(^9\) EGFSN (2010) Future Skills Needs of Enterprise within the Green Economy
bonus points system for higher level leaving certificate maths.\textsuperscript{10} The report also highlighted that the domestic supply of high-level skills into the ICT sector is dependent on what happens at all levels of education from primary onwards. The mathematical and scientific ability of students, coupled with their preference to study ICT or related subjects at college will influence heavily the quantity and quality of the graduate pipeline into the sector. It is therefore critical that numeracy is prioritised at the very early stages of education. In a similar manner, the 2007 EGFSN report on \textit{Future Skills Needs of the International Financial Services Industry} found that there was a significant shortage of graduates with high level mathematical proficiency, which is a pre-requisite for entry to the sector.\textsuperscript{11} The fact that participation in higher level mathematics at leaving certificate level is relatively low precludes many students from potentially very highly rewarding careers in the sector such as in actuary or risk assessment as they cannot advance to many relevant third level courses without honours maths.

4. Conclusion and Priorities

In summary, the reports of the EGFSN highlight, in very practical ways, the obstacles that can arise from an employment and skills perspective through skills deficiencies in literacy and numeracy. Developing these skills from the very early ages in the school system has importance for individuals throughout life, whether that is for those working in positions that have increasing basic skills requirements or for directing students towards highly skilled occupations that require high levels of proficiency in mathematics or technology. It is crucial from an enterprise point of view that literacy and numeracy skills are embedded from an early age and integrated throughout the primary and secondary school system. From the perspective of ensuring that literacy and numeracy in the school system can help young people to reach their full potential in their future working lives’, Forfás and the EGFSN would like to see the following issues prioritised in the final \textit{National Plan to Improve Literacy and Numeracy in Schools}:

- Ensure that the National Plan highlights the clear link between literacy and numeracy skills and their importance in the workplace, not only for underpinning basic or generic skills but also for encouraging students in to highly skilled occupations within sectors such as ICT, Financial Services, the Green Economy or Bio-Pharma/Pharmachem sector. This link should be made from the very early years of education and reinforced throughout primary and secondary levels.

- The emphasis the Draft Plan places on integration of literacy and numeracy with other subjects is most welcome. Integration of literacy and numeracy development within sectoral/occupation specific programmes have found to be particularly effective for adult learners, as this functional approach enables understanding and development of these skills in ways that are highly relevant to their own jobs and careers. The application of literacy and numeracy to ‘real life’ examples and problems is a recurring theme that emerges from EGFSN reports.

- Forfás and the EGFSN strongly endorse the draft strategy proposals for more frequent assessment and more effective use of assessment data. The greater the evidence base, the

\textsuperscript{10} EGFSN (2008) Future Requirement for High-Level ICT Skills in the ICT Sector
\textsuperscript{11} EGFSN (2007) The Future Skills and Research Needs of the International Financial Services Sector
more targeted and effective interventions can be designed and implemented. In parallel, it is also important to regularly benchmark and evaluate teaching practices based on Irish and international best practice in areas such as curricula, instruction, materials, and use of technology.

- Forfás and the EGFSN strongly support the prominence of continuing professional development and upskilling for practitioners throughout the school system in the Draft National Plan. It is important that CPD and upskilling options are made available on a flexible basis, for example, on a through modular, distance, part-time or non-term time basis.