"APPRENTICESHIP IN IRELAND"

Apprenticeship can play a role in National Recovery

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APPRENTICESHIP IN IRELAND:
A "REVIEW OF APPRENTICESHIP TRAINING IN IRELAND" was published
in 2013.   This review took a detailed look at the history of Apprenticeship
programmes in Ireland. It also notes that we live in a changing world and the

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European Centre for the development of Vocational Training estimates that by 2020, 50% of all jobs will need medium level skills and 15% will require lower level skills.

Other countries are making similar forecasts and it is suggested, that by 2020, in Germany, the labour market will have shifted substantially from the traditional jobs in manufacturing, mining and agriculture towards service oriented professions. Demand for highly qualified workers is predicted to increase while demand for vocational qualifications may decrease.

In Ireland too, the EGFSN(Expert group on Future Skills needs) forecast a continuing decline in employment in Agriculture coupled with a reduction in demand for unskilled labour. They also forecast increasing growth in more skilled areas such as Pharmaceutical, ICT and Medical areas. They concluded that Ireland's economy would continue to grow as a "knowledge-based" economy.

In 2013, unemployment in Ireland stood at 13% but Youth Unemployment was seriously out of step as it spiralled to 26%. Overall within the EU(27) Youth Unemployment jumped from 15% in 2008 to 23.5% in 2013. At European and national level, Social partners recognise the importance of Apprenticeship programmes in assisting the School to Work transition. Since 2008, the economic crisis has resulted in an increasing demand for Apprenticeship places but a decrease in the number of places available particularly as a result of the collapse in the construction industry.

Any review of employment and the labour market throughout the EU clearly shows that Apprenticeship programmes make a very significant contribution to the provision of sustainable employment for young people. The OECD, the International Labour Organisation and the EU have all highlighted the important role that Apprenticeships can play in modern economies.

The need to review Apprenticeship Training in Ireland is broadly recognised. As a country, it is true to say that, in recent years, there is a cultural bias towards Higher level education. We have almost become accustomed to the concept of the need for all Leaving Certificate students obtaining huge numbers of "points" leading to academic qualifications at Third Level. Apprenticeships should be clearly promoted with a strong brand image showing that Apprenticeships also lead to rewarding careers for those who choose that pathway.

The need to review and improve the efficiency of Apprenticeship in Ireland was highlighted by the OECD in their review of vocational training in 2010. "The strategic review of further education and training"(2013) echoes the findings of the OECD reports and emphasises the importance of greater linkages between employers on the one hand and the providers of Education/Training on the other. At the moment, the necessity for adapting and improving Apprenticeship programmes is being examined in Britain and Northern Ireland where the possibility of making funds available to employers to source their own training for apprentices is being explored. The Apprenticeship Training programme in the UK has been boosted and now includes 170 trades and it is planned to increase Apprenticeship places by up to one million.

There is agreement from all stakeholders of the importance of Apprenticeships and the "European Alliance of Apprentices" is an agreement between Employers and Trade Unions at European level to improve the quality and supply of apprentices. Under the terms of the EU Youth Guarantee funds are being made available to ensure that all young people under the age of 25 will get an offer of a job, apprenticeship or Education/Training place within four months of leaving formal education or becoming unemployed.

"Apprenticeship-type schemes are well spread all over the European Member States. 24 EU Member States have VET schemes which can be labelled as mainly company based, in the sense that more than half of the training activities take place in a company. However, in a wide majority of these countries, company based apprenticeships coexist with other mainly school-based training schemes, where tuition takes place at school most of the time, but there are significant components imparted at companies in a real work setting."

(Apprenticeship supply in the Member States of the European Union-EU 2010)

OECD NOTE FOR G20(2012):

There is general agreement on the need to improve the role of apprenticeships but less agreement on how exactly that can be achieved. **The 'OECD NOTE ON QUALITY APPRENTICESHIPS FOR THE G20 TASK FORCE ON EMPLOYMENT(2012)** identifies a number of criteria that would play a pivotal role in Quality Apprenticeship Programmes:-

- ➤ They should be available to both teenagers and adults.
- ➤ They should facilitate disadvantaged youth with possible subsidies to employers, if necessary.
- ➤ They could feature a pre-apprenticeship year as in Germany as this is regarded as good practice.
- ➤ They must have strong training component.
- ➤ They must have training "on" and "off" job.
- ➤ They must cover multiple sectors and encourage participation of women.
- ➤ There must be an Equitable sharing of costs.
- ➤ They should work towards competence-based completion rather than time-based.
- ➤ They should have good governance to avoid misuse of apprentices as a form of cheap labour.

➢ They should be jointly managed by Social Partners and relevant institutions.
➢ They should be certified by and integrated with formal education system.

KEY SUCCESS FACTORS
European Commission(2013):-
"Apprenticeship and Traineeship Schemes in EU27 - Key Success factors"

The European Commission in its report entitled "Apprenticeship and Traineeship Schemes in the EU-27 " makes the following points:_
1.Young people in the EU states have hit disproportionately by the Recession(Youth employment rose from 15% in 2008 to 23.8% in Spring 2013)
2.Apprentices play a critical role in helping young people make a smoother transition from School to Work(STW)
3.Countries with rigorous Apprenticeship schemes such as Germany, Austria, Denmark and Norway are most successful in facilitating STW transitions.
4.The proven benefit of schemes which combine work and study and allow young people to acquire a first work experience have led to increased interest at both National and EU level.
5.The European Commission has actively been seeking to promote work-based learning through high qualithy apprenticeships and traineeships as an effective tool for integrating young people into the labour market.

6.Apprenticeships have consistently yielded positive employment outcomes with the majority sourcing employment on completion. (The average proportion is 60%-70% while, in some cases, it is as high as 90%)

7. The AGE(Apprenticeship Grant for Employees) allows a grant of €1,500 per apprentice to be give to employers who are taking apprentices for the first time or those who have not taken in an apprentice in the past year.

8.In Sweden, the Apprenticeship Council identifies market skills Needs. In Denmark, Trade committees define the content of the education and training programme.

CONTRIBUTION OF APPRENTICESHIPS TO LABOUR FORCE:

It is interesting to compare the contribution Apprenticeships has made to the labour force in other countries as in the table below showing the number of apprentices per 1,000 employed persons(2009):-

Austria	England	France	Germany	Ireland	Switzerland
33	11	17	40	11	43

This table illustrates clearly Ireland's failure to capitalise on the value of Apprenticeship programmes over the years.   Further evidence of this is the fact that of over 58,000 who left education in 2011 only 2% of these entered apprenticeships.

APPRENTICESHIPS REQUIRE PARITY OF ESTEEM:

In any review of the Apprenticeship programme in Ireland it is important to raise the status of these programmes. There is an inherent imbalance, at the moment, in the sense that somebody who completes a four-year Apprenticeship programme receives a FETAC Level 6 award while a student who completes a four-year course at a Third Level college would receive a FETAC Level 8 award. Overall, there needs to be a change of heart with regard to the "Points race" because there is a significant number of our young people who are not well served by it and it does not serve the future needs of our growing, changing economy.

APPRENTICESHIP PROGRAMME IN GERMANY:

The success of the Apprenticeship programme in Germany needs to be considered in any efforts to revitalise the Apprenticeship system in Ireland. The VET(Vocational Education and Training) system is widely embedded as part of the German education system. It encompasses a broad spectrum of professions and adopts to the changing needs of society.

Germany and many other countries espouse the "Dual-system" which integrates School-based elements and work-based components. Central to the success of the German system is the positive engagement of employers and also an intricate web of state checks and balances.   The overall system is well resourced through a combination of public and private funding.

The real strength of the German VET(Vocational Education and Training) system is the "Dual" approach and the principles underpinning it. Variations of this model are in use in many European countries with different emphasis on different aspects. The German system is held up as a model to aspire to and, in particular, the integration of school-based and work-based learning both complementing each other. In this system the theory which is learned in school provides a background on how to deal with the practical everyday problems of particular occupations. On the other hand the student is experiencing practical challenges in the work place and can appreciate the value of theoretical applications.

The German system is based on the co-operation of key players in the dual system. Employers, through the Chamber system, are deeply involved in preparing curricula, supervision of training in the workplace and in assessment practice.   Employers thus are deeply committed to the apprenticeship system. The success of the German system is partly due to the fact that its apprenticeship system has a very high status among German families and school-leavers and the fact that Apprenticeships are available over a huge range of over 340 occupations. Apprenticeships are available in many occupations that would require Third Level qualifications in other countries.(See index for full list of occupations that are available to apprentices)

In Germany, compulsory education starts at six years of age and lasts for 9/10 years and after four years in primary school, students typically get tracked into three different education pathways and students typically enrol in a vocational pathway at age 15/16. It is interesting to note that, in Ireland, 47% of students pursue Third Level courses while the corresponding figure in Germany is 27%.

There are also some weaknesses in the German system that wouldn't necessarily transfer to Ireland. For example, many people do not like the fact that young people are making important career choices at the age of 15/16. It may also be

suggested that as we move towards a knowledge-based society that it is important that we get the maximum number of students to complete Leaving Certificate.

In countries like Germany where there is a great emphasis on the Apprenticeship/Dual system many students leave full-time schooling after only 9/10 years. In the German Dual system, students spend only 160 hours annually on academic education whereas in the Danish Dual system they spend between 30% and 50% of their time on school programmes.

In Germany, the final assessment of Apprentices has three components:-

(i) they receive a certificate from the part-time VET school.

(ii)Training employer gives a written report.

(iii)They sit for the final CHAMBER EXAM which tests their occupation-specific skills . The Chamber Exam is most important and passing it allows the student to obtain their VET qualification.(School-based tests do not have to be taken into account)

CERTIFICATE OF PRACTICE IN NORWAY:-

A Pilot Project being pursued in Norway offers a 2-Year practice based programme following completion of lower Secondary School, targeted at pupils with poor motivation towards academics.

This enables all students to get a certificate after two years and allows students to complete Secondary school and it also allows pupils to obtain competencies at a lower level.

A Certificate of Practice allows a stepping stone for further education(includes Maths, Social Sciences, Literacy) Students can choose among 16 Subjects in the sectors of Agriculture, Fishing, Forestry; Restaurant and Food Processing Trades, Building

and Construction, Health Care, Technical and Industrial Production, Services and Transport.

It is recommended that this upper Secondary project being pursued in Norway should become a part of the Irish Post-Primary system. The proposal to offer a "VOCATIONAL LEAVING CERTIFICATE" programme following the Junior Certificate would combine the best of the German Dual-system with the attractive goal of allowing the maximum number of students complete their Leaving Certificate and to postpone their final decisions on future careers until Leaving Certificate is completed.

The Vocational Leaving Certificate Programme would be primarily aimed at those who might wish to pursue an apprenticeship and would place great emphasis on Practical and Technical subjects but would also integrate Literacy, Numeracy, Maths and Science into the programme.

PROPOSAL ON APPRENTICESHIP TRAINING IN IRELAND.

Definition:

Apprenticeship programmes are defined, for the purposes of this presentation, as a programme of education and training that combines work-based experience and training with school-based education leading to a defined specific qualification recognised as part of the NFQ(National Framework for Qualifications.) School-based refers to periods of theoretical/practical education followed in School/College/Training Centre combined with modules of general education with emphasis on Literacy and Numeracy. It is intended that a contract between apprentice and employer is a prerequisite to all Apprenticeship programmes.

It is regarded by many employers that the current model for Apprenticeship programmes in Ireland is too rigid. The rigidity of a system where "one size fits all" militates against the flexibility that is needed in workplaces that are changing over time and new demands are coming regularly.

CURRENT APPRENTICESHIP PHASES:(for most apprenticeships)		
Phase	Delivered by:	Minimum Duration
1	Employer	12 weeks.
2	ETB	20 weeks
3	Employer	26 weeks
4	Institutes of Technology	10 or 11 weeks.

5	Employer	26 weeks
6	Institutes of Technology	10 or 11 weeks
7	Employer	12 weeks.

The main weakness of Apprenticeships in Ireland was an over dependence on Construction.   Apprenticeship registrations rose to a peak of 8,305 in 2005 and fell to 1,434 in 2012. Due to the collapse of the Construction industry following 2005 the number entering apprenticeships in 2013 were only 20% of peak year figures.

The Apprenticeship programme in Ireland needs to be revised, re-invigorated and made fit for purpose in the type of labour market we live in today. Apprenticeships can make a huge contribution to Enterprise, to the Economy in general and to our young people as we try to equip them for meaningful, productive, sustainable careers in the years ahead. We are regularly told by employers that, despite having thousands of unemployed Third-level graduates, that they cannot find people with the skill set needed to fill vacant positions. This is a regular occurrence in the ICT sector. Apprenticeships can overcome these problems following work-based training and on-the-job experience.

The Training element of Apprenticeship programmes should be, at least, 50% work-based learning. Graduates of Apprenticeship programmes should be qualified to work autonomously. Legislation should be much more flexible so that agencies can respond to changes in the workplace and not stifle the need to expand the range of apprenticeships.   It should not be required that areas of industrial activity to be designated by order of Oireachtas as is the case currently. Legislation should maintain protection for apprentices. Legislation should continue to lay down the broad parameters setting out the obligation of the employer to have capacity to carry out training and be prepared to release apprentice for off the job phases. Legislation should underpin right of assessors to visit work places. Legislation needs to be much more flexible.

CURRENT APPRENTICESHIP TRADES:	
Current Apprenticeships lead to a Level 6 NFQ aligned to European Level 5 qualification. All programmes are 4-years except printing which is 3-years.	
CONSTRUCTION	Brick and Stone laying Carpentry and joinery Floor and wall tiling Painting and Decorating Plastering Plumbing Wood Manufacturing and Finishing
ELECTRICAL SECTOR	Electrician Electrical instrumentation. Instrumentation. Refrigeration and Air Conditioning Aircraft Mechanics. Electronic Security Systems.

MOTOR SECTOR	Agricultural mechanics.
	Construction plant fitting
	Heavy vehicle Mechanics
	Motor Mechanics
	Vehicle body repairs
ENGINEERING	Mechanical automation and Maintenance fitting
	Metal Fabrication
	Sheet Metal work
	Toolmaking
	Industrial insulation
	Farriery
PRINTING SECTOR	Print media.

The table above indicates the range of apprenticeships currently on offer in Ireland and a glance at the list of less than 30 occupations shows the need for a total revamp. This is particularly true in light of the fact that, in 2013, 77% of all workers were employed in Services. The percentage employed in Industry(including Construction) had declined to 18%. This statistic, though, needs to be analysed in depth because the collapse of the construction industry and the consequent flight of many of our experienced qualified tradespeople will inevitably lead to a major scarcity in many areas when the Construction industry begins to grow again.

It must also be noted that skill shortages have been recognised in various occupations including Science(Medical devices sector), Engineering(Tool design, Mechanical and Electrical), ICT(Software developers), Financial services, Health(NCHD's & Nurses) Sales(Technical Sales, online sales) Clerical, Non-construction crafts(Tool-making, CNC machining).(National Skills Bulletin 2013-SOLAS)

The European Apprenticeship models have the support of three important stakeholders, namely, Government and state agencies, Public and Private Enterprises and Trade Unions.

The "Dual-mode" system which is highly developed in Germany allows for great collaboration between Enterprise and Training providers. In Ireland, we also need an apprenticeship system that is enterprise led and is flexible enough to make changes as required. The employers must be included in the overall planning of programmes as it is they who can best identify needs and pinpoint occupations that need to be considered for inclusion in apprenticeship programmes.

In Germany, young people make important decisions about their future careers at a young age so that many who go the Apprenticeship route may leave compulsory schooling with less than adequate skills for their adult lives. This becomes very important in a world where careers change and people need to be able to adapt, to re-train or continue with further education. The entry level for Apprenticeships, at the moment, is set at five Grade D's in the Junior Certificate. I believe that this basic requirement should hold into the future. The reality is that most people who have entered apprenticeships in recent years actually had Leaving Certificate

standard. It is important that young people who may not be motivated to progress to academic courses should not be discouraged from entering an apprenticeship programme. Equally, as we look towards the future and see the importance of knowledge-based industries it is appropriate that we encourage as many students as possible to complete their Leaving Certificate.

I am proposing that an option of a "Vocational Leaving Certificate" be made available in our Post-Primary schools. This would mean that students who wished to do so could pursue a course following their Junior Certificate which would be a preparation for an Apprenticeship programme. This would have the clear advantage of giving real choice to students who may have difficulties following academic courses or to those who may not be motivated to continue on to Third Level Education courses.

As part of this recommendation students would follow a programme which would have far greater emphasis on Practical subjects but would also lead to an examination in Literacy, Numeracy and Science. In this way, options are being kept open and students retain the option of either an Apprenticeship path or a Third Level path. A vocational Leaving Cert Programme also offers real choice to many Post-Primary students who would probably "learn better by doing" and would probably have a positive effect on early school-leavers. Apprenticeships can offer hope and real prospects for rewarding careers to the large cohort of students who will not complete Third Level successfully.

Some doubts exist as to whether the reading attainments of 15-year old Germans is sufficient foundation for adult working life. An employer survey carried out in 2009 showed that employers were concerned about the level of Literacy and Numeracy skills. In countries like Germany where there is great emphasis on the Apprenticeship/ dual system many students leave full-time schooling after only nine or ten years. In the German dual system students spend only 160 hours annually on academic education whereas in the Danish dual system they spend between 30% and 50% in a formal school situation.

The proposal to establish a vocational Leaving Certificate course would lead to the students having strong basic skills and would help prevent drop-out. Stronger academic skills will also enhance the person's mobility. The point is made that academic skills depreciate more slowly than vocational skills. It is also recognised that solid academic skills facilitate the pathway to higher education.

In Germany, the final assessment of apprentices has three components:-
(i) Apprentices receive a certificate from the part-time VET school.
(ii)Training employer gives a written report.
(iii)Apprentices sit the final "Chamber Exam" which tests their occupation specific skills and knowledge. (The Chamber Exam is the most important and passing this allows the student to obtain their qualification)
It is recommended that in order for apprentices to obtain a qualification that it is their attainment in their occupation specific skills and knowledge that receives priority and will decide their ultimate qualification. It may also be considered

appropriate to include a "school-based" mark in the final qualification which would assist the apprentice in ensuring pathways to further and higher education but would not prevent them from obtaining a qualification as an apprentice.

DURATION OF APPRENTICESHIP PROGRAMMES IN IRELAND:
Any review of the Apprenticeship system in Ireland must adopt a more flexible approach to the duration of apprenticeship programmes. At present, practically all apprenticeships are for a four-year period and this needs restructuring. One problem is that Apprentices who do not pass the final examinations receive no qualification at all. There needs to be a system whereby apprentices can receive recognition for stages of the apprenticeship programme. Where it is deemed necessary to have a four-year programme there should be graduated levels so that the apprentice receives recognition for the successful completion of two years and possibly further recognition for the successful completion of a third year. Overall, the list of trades/occupations needs to be expanded so that the apprenticeship system reflects the labour market of today and into the future. In such an expansion it will be seen that all occupations will not require a four-year apprenticeship programme. I recommend that there should be:-
(i) Two-year apprenticeship programmes.
(ii)Three-year apprenticeship programmes.
(iii)Four-year apprenticeship programmes.

ACCREDITATION:
At present, all apprenticeships receive a FETAC Level 6 accreditation.   There is need for a readjustment of the qualifications being awarded to apprentices in light of the duration of the apprenticeship and the skill sets being covered in specific apprenticeships. It is strongly recommended that 4-year apprenticeships be brought more in line with the Qualification level to be achieved by those who have taken a four-year Third Level course while the Qualification level of the apprentice who obtains their qualification after two years would receive accreditation at a lower level.

It is important that our young people and their families grant the same parity of esteem to Apprenticeships as they do to other fields of study. Each pathway must be seen as being of equal value and this can best be achieved by ensuring that each Apprenticeship stage is recognised as a stepping stone to Further or Higher education.

THE TIME IS RIGHT TO LOOK AT APPRENTICESHIPS:

There never was a better time to look at the whole area of Apprenticeships than the present moment. In fact, it is critical that we analyse where we are going, as a country and prepare for the future of all our school-going population.

When the main date for CAO applications was reached in 2015 a total of 74,499 had applied for third level courses which was 1,500 more than in the previous year or 3,000 more than applied in 2013. The significance of these figures is the fact that it reflects the ongoing trend towards larger numbers of School leavers in search of more and more College places.

Right across the population we have been conditioned into thinking that the only way to really prepare for a good life and a successful career is to seek the maximum number of points and to proceed to degree level in a third level College.

We are witnessing the education system being stretched as a result of cuts in the wake of the general recession. We have seen a 10% cut in funding in higher education over recent years but at the same time the system has had to cater for a student population which has increased by approximately 15% over the same period.

We are now seeing the 'growing up ' of those born during the millennium baby boom and an increasing percentage of our school-leavers aspire to Third Level places. Currently, approximately 55% take the Third Level pathway and if this trend continues it would mean that the country would need to supply about 56,000 first year College places in 2028. The rising numbers will have repercussions for the economy and for the students. How will these larger numbers be catered for? Are we going to see increasing points to ration the number of places or will the country be able to supply enough places to cater for the ever-increasing demand? Any analysis of the figures and the resources must clearly see that an improved Apprenticeship system can make a real contribution to solving and balancing the education system.

The "Expert Group on Future Funding of Higher Education" which was established by Minister Ruairí Quinn reports that the current funding for Third Level is "insufficient to maintain Quality" and their analysis of school leaving statistics over the coming years leads them to conclude that there will be a deficit of 20,000 college places by 2028.   As the numbers of school leavers increase to the predicted levels it will require a huge jump in required funding to supply the number of College places. Alternatively, other models of funding may be considered which would place an additional burden either on the students or on their families.

Decisions will be required and detailed consideration must be given to the Apprenticeship system so that it can make a sustainable contribution to the future of our school-leavers and also be of real value to our economy and society in general.

THE VIEWS OF PRACTITIONERS WITHIN POST-PRIMARY SECTOR:
The context in the current education system in which young people and their parents are making course / career choices is as follows:
<u>Students after Junior Certificate</u>
<u>Transition Year</u>
Advantages:
- Opportunity for personal development
- Maturity
- Career investigation / work experience

Disadvantages:
- Not available in all schools
- Variable standard of progress
- Cost a factor for many

<u>Leaving Certificate Applied:</u>
Advantages:
- Module based programme
- Caters for the less academic
- Improves school retention rates

Disadvantages:
- Limited recognition
- Parental resistance

Leaving Certificate (Traditional)
Advantages:
- Academic programme
- Points CAO

Disadvantages:
- Points race
- Third level College Courses main priority

LCVP(one Subject)
Advantages
- Academic Programme
- Points CAO
- Career investigation

Disadvantages:
- Points race creates pressure that does not allow sufficient development / recognition of the vocational aspect.

Reasons Students Progress to Senior Cycle
- Points for progression to Third Level Courses
- Societal expectation
- Parental expectation
- Age
- Lack of employment opportunities (only low skilled menial work available without Leaving Cert)
- Parental Expectations / Aspirations following Junior Certificate:

In the present culture in Ireland the aspiration of most parents is for their child to obtain a "good Leaving Cert "(whatever that means to them) with the aim of "going to college".

This aspiration results in some students taking the course and studying subjects that they are poorly suited for, have little or no interest in and are unlikely to achieve any significant success.

The question from many is "What good is this stuff?"

The question raised is challenging. These young people have intelligence and ability that is not getting an opportunity to be nurtured / developed at second level. This should be the starting point for some potential apprenticeship applicants.

The "Good with his/her hands attitude". This perception particularly with parents has led to students leaving school to join a trade – often any trade that has a vacancy – without sufficient interest or natural ability.

This will result in poor matches between skills, abilities and the quality of trained personnel.

The development of apprenticeships requires that parents and students are "educated" on the potential for career development.

Employers and companies need to play and probably are willing to play a much more active role in changing and developing the perceptions around apprenticeships and the career opportunities available.

The notion of showing the picture of the lathe rather than the component manufactured needs to change.

Career personnel in schools also need to be given professional development training on the possibilities of apprenticeships, the potential and education paths available if / when revised structures that reflect the demands of the economy emerge.

Career Guidance Councillors have a key role but they must have confidence around the advice they are presenting to their students and their parents.

Career Potential:

The development of a clear progression route that will provide training in the trade/ industry with the real possibility to progress to further education at Third Level (Level 7/8) and the further possibility of a Post Graduate qualification in business management should be the target.

This progression should be along recognised pathways that are available to the best and most ambitious apprentices.

This would bring about a change in attitude and attract the calibre of candidate required by industry with skills, ambition, education and the ability to develop the technological industry that must be part of our economy.

Example: Toolmaker /Mechanical Engineer Graduate/Business Management

The apprentice starts and qualifies as a Toolmaker. They then progress to achieve a Mechanical Engineer qualification which gives them the academic background for design and product development and eventually proceeds to obtain a Business Management qualification to enable them to manage a company.

0-0-0-End of contribution from Practitioners-0-0-0

CAREER CHOICES/OPTIONS:

While the 2013 review did not fully agree with the dual programme as in the German model the weaknesses identified could be addressed in an Irish context.

A certificate of practice model undertaken in Norway as a pilot project seems to have many characteristics that could be modified to the Irish education system possibility utilising Transition Year.

A student could have one year to explore the potential of the apprenticeship and if successful this year would form some of the modules for the apprenticeship or alternatively the year would provide a transition year qualification with the student returning to main stream Leaving Certificate.

The challenge of this would be around the provision of resources in the schools and the training centres.

An essential part of the curriculum would be Maths, Communication English and I.C.T.

Quality of Training Provision:

The development of truly modern apprenticeship system will require the up skilling or recruitment of tutors to ensure that the skills being taught reflect the developments and changes in the various industries.

At the qualification level the system of awards needs to be developed that reflects accurately the ability of the candidates. The concept of pass/ fail is outdated.

APPRENTICESHIP PROGRAMMES GIVE VALUE FOR MONEY:

The average annual Gross cost to the State for the delivery of the Apprenticeship programme and associated supports for each Apprentice including Allowance costs gives a total of €32,290.

In 2011, a total of €316 Million was paid into the National Training fund through the Employer Levy. €52 Million of this was used to contribute to the Apprenticeship Programmes.

When the Training Fund contribution is offset against the gross cost to the State it means that the Average Net Cost to the State per apprentice was € 4,705 in the year 2011.

This cost per Apprentice is comparable with the annual unit cost for the delivery of laboratory based courses at an IT for students of Engineering which works out at approximately €10,233 or €11,755 at University.

WET-TRADE APPRENTICESHIPS:

WET-TRADE Apprenticeship registrations in Ireland 2005-2013				
	Tiling	**Plasterers**	**Block-Laying**	**Painting**
2005	41	278	599	149
2013	0	8	3	8

The collapse of the Construction Industry in Ireland has resulted in the complete collapse of Apprenticeships being registered in the "wet-trades"

This problem needs to be addressed immediately as it can only lead to a severe shortage of young people with the required indigenous skills. We believe the Irish economy is set for some expansion and growth. It is also predicted that employment is the construction sector will increase sharply over the coming years(DKM) particularly in light of the fact that there is an acute shortage of residential units in certain growth areas around the country.

A shortage of apprentices in the wet trades could choke the ability of the Construction industry to respond to the need for additional homes. The huge decline in the number of registrations means there is a real urgency in offering some incentives to employers. The greatest incentive that would be appreciated by Employers would be if apprentices could be trained to a level that they are 'site-ready' and able to make a real contribution on-site.

Being 'site-ready' raises the question of a pre-apprenticeship programme which could be undertaken by students before they start their formal apprenticeship. During this period, there would be an emphasis on Health and Safety and on the training would be skill-specific to the apprenticeship they are going to work on.

It is also envisaged that a number of vacant Vocational schools that are under the auspices of the ETB's could be put to good use in the delivery of aspects of the Vocational Leaving Certificate Programme and aspects of the Wet Trades pre-apprenticeship modules.

It has taken a long time for the Construction sector to show any signs of recovery since the collapse of 2007 but the Construction Industry Federation have estimated that the sector will show an increase of 15% in activity for 2013 compared with the previous year. Experts suggest that building 25,000 houses per year is sustainable. The CSO predicts that the greater Dublin area will see an increase in population of 400,000 over the next fifteen years while our other principal cities are also poised to see real growth in population.

CIF predict that in the region of 400 apprentices need to be registered per year in these four areas.

EMPLOYERS FEAR LOSS OF NEWLY QUALIFIED APPRENTICES:

Smaller companies and SME's who invest both time and money in training apprentices sometimes find that once they have successfully completed their training and obtained their qualification that they use their qualification as a passport to finding work with larger companies or to emigration.

This has repercussions for the smaller business and the smaller employer even in cases where they have a job available and where they offer full industry rates of pay. Many good employers running successful businesses are reluctant to take on the obligation of training an apprentice over a four-year period only to find that they are left 'deserted' and that their investment is going to end up helping somebody else.

Some employers who have had such an experience point to the necessity for the trained apprentice to offer some loyalty to the employer by way of remaining in their employment for a certain period of time if there is a job available and if that job carries full industry rates and entitlements. We must also be mindful of the investment of the Irish taxpayer in this instance and it is important that our economy does not lose out totally following the investment in the person's training.

ADVANCED TRAINERS:

It is recommended that Trainers who have modern up to date knowledge of the processes, methods and machinery that are available on work sites today be employed to give training to all of those who are undergoing training as apprentices.

It is of utmost importance that apprentices are not being trained in outmoded practices as it is essential that they are ready and able to make a contribution to their place of work.

SUMMARY OF MAIN RECOMMENDATIONS:

1. GOVERNANCE:

a).The legislation on Apprenticeships in Ireland must be adapted so as to allow all

agencies and stakeholders more flexibility in all areas of the system.

b).**SOLAS** and its staff have a long tradition of experience in the Apprenticeship programme and should continue to have responsibility for the administration of the programmes on a national basis. In approving Employers for taking on apprentices they should assess Employers on the basis of the training opportunities they have on offer, the work experience they can give and the overall work environment they have to offer rather than any "paper qualifications"

c).The proposed Apprenticeship Council would have a key role in the overall management of policy and would have all stakeholders represented with Employers having an important input to ensure that Apprenticeships are market regulated.

d).This Council would have overall responsibility for design, duration and entry requirements and would liaise with Employer bodies to regulate the number of places to be provided.

e).ETB's at local level must develop linkages with existing Enterprises, Companies and SME's in their areas with a view to establishing needs of Employers and Trades people at local level and submitting guidance to Apprenticeship Council so that Apprenticeships are made available as needed.

2. EQUITY:

a).Gender balance is necessary and this can best be achieved by a major expansion of the occupations/trades which are open to Apprentices.

b).Apprenticeships must be structured so that programmes can assist early school-leavers or students at risk of dropping-out of the education system to become involved. Young people who have left school early and acquired skills through their work should have these skills recognised if they wish to enter into a mainstream apprenticeship

c).Persons with disabilities must also be catered for as part of the Apprenticeship programmes.

d).Pathways to Further Education and Higher Education must be clearly signposted if Apprenticeships are to play a major role for young people seeking rewarding careers.

3. RANGE OF OCCUPATIONS:

a). A major expansion of the range of occupations suitable for Apprenticeships is

central to this recommendation. Employers and Employers bodies must be brought on board to identify how best to expand this list in a way that offers sustainable choice to School-leavers.

b). See attached list of occupations which are used by Apprentices in Germany.

4. FUNDING:

a).Apprenticeships into the future must allow costs to be shared between Employers, State and the Apprentice.

b).Apprentices undertaking courses as part of off-the-job training should be treated in the same way as students attending Third Level Colleges and must be entitled to the same allowances, grants or maintenance allowances.

c).Employers must continue to pay the Apprentices for "on-the-job" employment but should not be "out of pocket" for Training pursued by the Apprentice "off-the-job".

d).The role that the employer plays in Apprenticeship programmes by reducing unemployment and contributing to the provision of worthwhile sustainable careers must be acknowledged and employers should be able to obtain some subsidies or a reduction in Employers PRSI.

e). The problem of Apprentices leaving their Employer as soon as they have attained a qualification needs to be addressed , particularly for small enterprises. Employers should be entitled to reimbursement of some of their expenses or an additional tax credit if they have trained an apprentice and then find that they have to start all over again.
f).EU funds and Youth Guarantee funds should support Apprenticeship programmes.

g). The National Training Fund Act(2000) provided for a levy on employers which was paid into the National Training Fund. Part of this fund should continue to be used to fund Apprenticeship Programmes.

5. RECRUITMENT:

a).Responsibility for recruitment must continue to rest with Employers who must have recruits sanctioned by SOLAS.

b).In order for Employers to gain sanction for themselves as suitable hosts for

Apprentices there must be a mechanism to examine the Employer and working environment being provided instead of relying on paper qualifications.

c).Minimum level requirement for recruitment of Apprentices should continue as is....but there must also be opportunities for students to fulfil minimum entry requirements through a pre-Apprenticeship course or through approved work experience.

d).Entry requirements must be sufficiently flexible to cater for young people who may have left school area but have gained skills and valuable work experience but may not have any "paper qualification". The system must be able to recognise prior learning(RPL)

6. CURRICULUM:

a).Curriculum development should be devolved through SOLAS to ETB's or Higher Education bodies but must take full cognisance of the evolving needs of Employers.

b).Employers must be in a position to identify standards and shape curriculum so that Apprentices and the skills they obtain match the requirements of the Employer.

c).Technical and occupational skills must be the most important aspect of all Apprenticeship courses.

d).Different Trades/Occupations will have Apprenticeship programmes of varying duration. Courses would vary between two, three and four-year courses.

e).FETAC qualifications would vary according to duration of Apprenticeship programme.

f).Clear progression path provided for all who receive Apprenticeship qualification.

g).Progression to Diploma or Degree level must be fully transparent.

7. ASSESSMENT:

a). Different disciplines/trades should lead to awards at different NFQ levels.

b).Interim awards should be made as certain stages are completed.

c).Prior learning and experience should be accredited.

d).All programmes should be subject to quality assurance arrangements of QQI.

8. DELIVERY:

a).Work-based Training should consist of more than 50% of all Apprenticeship programmes.

b).Employers must play an important role in the delivery of Training and experience.

c).ICT and web-based training allows new opportunities for training and these could be fully utilised as part of a Vocational Leaving Certificate Programme or work-based Training.

9. PROVIDERS:

a).Off-the-job Training should be delivered under the auspices of ETB's, Institutes of Technology or Universities.

b) Training Centres, under the auspices of ETB's should be established in certain disciplines, for example, Wet Trades. A number of vacant vocational schools around the Country would be ideal for this purpose.

c.)Literacy and Numeracy skills must also be included as part of Apprenticeship programmes.

10. ECONOMY:

a).Apprenticeships will play a huge role, particularly as the numbers of School Leavers continue to grow and the range of occupations to which Apprentices can apply is expanded.

b).As shown, the cost to the state of each Apprentice is very competitive when compared with others who pursue the Third Level Degree pathway.

c).Apprenticeships offer Employers the guarantee of being able to train staff that will attain the skills that match perfectly the ones required in their place of employment.

CONSTRUCTION AND RELATED INDUSTRIES - SKILLS REQUIRED:

PIPE-LAYING:
From discussion with various contractors there is evidence that most Pipe Layers are in their twilight years and there is no course available in Ireland where a new generation of Pipe layers can be trained.
We will need to work with Civil Contractors to draw up an appropriate formula and a proper strategy that will prepare us for the years ahead. It is recognised that, at the moment, this is a dying skill and as the economy recovers - this is a skill set that will be required and we need to prepare for that now.

HYDRAULIC FITTERS/DIAGNOSTICS:
Once again, we are struggling find people who are qualified in the field of Hydraulic Fitting. As machinery becomes more complicated and more technically advanced with a greater emphasis on Electrics and Computer-aided settings we need people who are suitably trained and have auto-electric experience.

MECHANICS:
There is a real shortage of mechanics. People working in the Agri-sector and Construction sector have voiced the opinion over and over again that they would be more than willing to take on Apprentices if they were allowed to do so. They regularly point to situations where they are blocked from employing apprentices because they don't have formal qualifications.
There are many competent fitters in the workplace who may be in the 50-60 age bracket and who have no "paper" qualification but who would be eminently suited to providing workplace experience and training to a young apprentice.
SOLAS are rightly tasked with the job of approving employers for the purpose of taking on Apprentices but we need to find a way of recognising the fact that it is the level of skills that can be passed on and the amount of quality work experience that

can be shared that makes an employer suitable rather than formal educational qualifications.

We will need, at least, 1,000 fitters in the short-term to replace existing employees who will be retiring in the foreseeable future. The importance of Fitters being able to multi-task must not be overlooked and they should also be qualified as welders so that they can be fully prepared for the practical reality of the work place.

TOWER CRANE DRIVERS, CRAWLER CRANE DRIVERS, MOBILE CRANE DRIVERS:

We have an aging group of drivers in these situations. I believe there is a strong argument to be made for "tie-up" between all of the companies operating these machines e.g. Mobile Crane Drivers should also have Lorry Licence. There is no reason why Drivers should not be trained to dismantle cranes as well.

It is not possible to learn most of the skill required on site as all of the operators need to be operating to top quality standards when completing construction work on site. We need a base at which these drivers can be trained where they can gain experience in all types of conditions and also gain the key skills required.

As Construction grows and Roads, Bridges and large buildings are being built there will be a severe scarcity of Drivers unless we move forward fast and ensure that sufficient numbers are trained.

EXCAVATOR DRIVERS:

The present situation where a "ticket" says you can drive a digger is not sustainable. The ability of drivers to work under various conditions is often not fully tested. Drivers need to be trained in and have some experience of Slopes, Trenches etc before going on site.

Before going on site an apprentice driver should spend up to one year in a Training centre dedicated to replicating the various conditions that the driver may come across on site. This should commence with a simulator which would prepare the driver for the various responses required. Such a training centre would have the capability to provide with actual "on-digger" experience that drivers need to be familiar with. This would include Slopes/Slants, Trench Boxes, Rock-breaking, Soft ground conditions, Loading and weight bearing and awkward positions. Drivers need to be equipped with the skills and given the experience so that they are prepared for all types of challenges that they will face on real sites.

It is envisaged that such a training course would last for one year.

LINESMEN:

It is planned that by 2020, Ireland will have Broadband rolled out throughout the country with an investment of over €1Bn. 16 Linesmen are currently being trained per year and from checking with both Public and Private enterprises there appears to be a need for 250 Linesmen per year over the next 5 years.

A Training centre in a central location such as Athlone would be ideal and could be integrated with training at AIT. Alternatively, Training could be provided at Mount Lucas(Offaly) which would be convenient to Athlone IT.

PRECISION ENGINEERING, MILLING MACHINES, HYDRAULIC RAM ENGINEERING, RADIATORS/COOLINGS SYSTEMS.:

Above is a small example of the very extensive list of sectors where Apprentices will be needed over the coming years so as to avoid severe skill shortages in these sectors.

WELDERS:

In an extensive investigation it is clear that, at least, 200 welders will be required to be registered each year over each of the next five years. All welders should be trained in Light, Medium and Heavy Engineering and certificates should be provided for each qualification attained and brought up EN 10-90. It is important that all welders be competent in the use of the various types of machines available e.g. Mig, Tig and Gas welding.

ELECTRICIANS:

As more sophisticated machines become more widely used in Ireland we need advanced auto electricians who are competent to deal with the ever increasing advances.

THE HOSPITALITY SECTOR - SUPPLYING THE SKILLS

Supplying the skills required to meet the needs of the Irish Hospitality Sector

Compiled By

Emmett Corcoran

On the request of

Deputy Michael Fitzmaurice T.D.

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Use the National Training Fund and Failte Ireland to establish a dedicated Hospitality training program, based on a workplace apprenticeship model

Develop a dedicated program with the specific goal to facilitate school finishers and early school leavers with a structured hospitality work placement apprenticeship scheme
Introduce a framework to deliver certification for experienced workers facilitated by industry (including it's representative groups) which can be accredited in accordance with the National Framework of Qualification (NFQ)

Supply & Demand

Introduction

Since 2011, industry representatives of the Irish hospitality and tourism sector have been lobbying government to establish a dedicated training fund to address the crippling shortage of skills which has been developing in the sector.

Before 2009, Failte Ireland administered a workplace apprenticeship scheme to educate and train individuals in the hospitality sector to entry and craft level competencies, and since the ending of this scheme the availability of trained and suitably skilled workers in Ireland's largest indigenous employment sector has been decimated.

During the naughties, the shortfall in skilled labour was primarily filled by immigration of workers from other european states, however even this supply has decreased in recent years given the availability of greater opportunities throughout the continental mainland of europe for individuals in the sector.

In March of 2014, Stephen McNally, president of the Irish Hotels Federation (IHF), demanded that action be taken so that Ireland can cater for growing tourist numbers from abroad in the years ahead.

Likewise, Restaurant Association of Ireland (RAI) CEO Adrian Cummins, says "there is now a crisis in the shortage of chefs in the country, and an investment in training is needed. An immediate training fund needs to be made available to employers so that the huge demand for chefs of all grades can be met."

The industry as a whole experiences a natural attrition of 3,000 jobs that require replacing on an annual basis, due to retirement and natural migration of workers. Reports from the RAI & IHF put the current immediate vacancies in the hotels and restaurant industry at circa 3,300 entry and craft level positions.

The outcry from industry, and the rapid growth of the sector, indicates a clear need for immediate action to fill the skills gap that has been created over the last number of years.

How to fill that gap is however one that requires further research as the reasons for the lack of interest in the ample career opportunities offered in the hospitality industry from young people is still anecdotal.

Some in the industry argue that the shortage of skilled hotel and catering staff available in Ireland tod ay is due to the industry's unglamorous reputation putting young people off.

Others say the industry isn't doing enough to work with third-level institutions to maximise staffing opportunities and training.

Traditionally hotel staff worked long hours for modest pay but that's all changed in recent years. The industry is governed by the minimum pay rates and people working in the sector can move on to senior positions in a much shorter timeframe than in other professions. It has been argued that greater education, of young people and particularly at second level, of the career opportunities in the hospitality sector would result in greater numbers taking up positions at third level.

Many within the industry believe, myself included, that accredited workplace apprenticeships would give a significant boost to numbers who would enter the industry. The RAi report that with government assistance, they could develop such programs for over 1,000 participants. This was part of the pre-budget submission for 2015 made by the RAI.

What skills are in demand?

Individuals with entry and craft level skills are in the highest demand. The RAI reports that 300 positions require immediate filling, while in 2014 the IHF reported that 3,000 vacancies went unfilled.

The shortage of qualified chefs is one that has plagued the hospitality industry here for many years. Driving the overheads associated with employing chefs up on everything from salaries to added benefits. Industry reports show that this continued short supply combined with ever growing demand could result in making Ireland "quite uncompetitive" and "less attractive" to foreign visitors by the year 2020. *(Multiple industry reports published between 2012 and 2015)*

A survey carried out, for this report, in January of 2015 of 25 hotels across Ireland showed that 82% of hotels reported long delays (more than 6 weeks) in sourcing suitably skilled staff for positions which include waiting staff, receptionists and accommodation staff. More than half of the hotels surveyed said that they normally recruit constantly for chefs as the supply is unpredictable and migration of chefs regularly leaves them with a insufficient kitchen staff.

In February 2014, Michael Vaughan, President of the IHF, stated "the hotels sector faces a significant skills shortage at entry level that is getting progressively worse as the sector returns to growth and that a clear role exists for SOLAS and the local Education and Training Boards to help address this demand."

The IHF emphasised the need for a new model for apprenticeships in the sector and greater clarity on how future training requirements will be met. To be effective, this must involve greater collaboration with industry and better use of existing resources across Education and Training Boards, VECs and Institutes of Technology.

What is industry doing to balance skills supply and demand?

There are a number of representative bodies which industry has established in order to formulate policy and work with government and academia in order to safeguard the future growth and prospect of the tourism and hospitality sectors. These representative groups include but are not limited to; The Irish Hotels Federation (IHF), Restaurants Association of Ireland (RAI) and Irish Tourist Industry Confederation (ITIC).

Each of these bodies engage regularly with policy makers and facilitate communication between industry and government. They also monitor industry trends and engage in proactive campaigns and efforts to ensure the needs of their members are considered and met by the relative stakeholders.

The Restaurants Association of Ireland is calling for investment in training to be offset against employer's PRSI. The RAI is also proposing 1000 workplace apprenticeships for the Restaurant Sector. Asking government to assist participants in the Restaurant Apprenticeship Scheme that they should be allowed access training allowances equal to those given to Solas apprentices.

What is government doing to assist industry in their efforts?

The government has granted funding to set up a professional cookery course that has taken 100 long-term unemployed off the Live Register and trained them in an intensive workplace programme. This is no doubt a positive move. However, there is further investment required in people in order to deliver the skills required by industry.

The government also facilitates a number of third level and PLC courses through the mainstream education system. However it is widely accepted that out of the box thinking is required if the ever growing skills gap is to be closed and further crisis averted.

The Restaurants Association of Ireland said the industry is now facing a huge crisis and has to look outside the country for chefs as cutbacks at the start of the recession has seen fully-fitted state-owned training centres lying idle and decommissioned throughout the country.

In September 2013 the joint committee on jobs, enterprise, and innovation committed to call in three government departments to see if a solution can be found before the chef shortage escalates further and committee chairman Damien English said it was a crazy position that 1,000 workplace apprenticeships could be available and that a solution was needed. The same proposal was part of the RAI's 2015 pre-budget submission, along with other proposals to ensure continued growth in the industry.

The Numbers

The tourism industry in total is responsible for over 200,000 jobs or 11% of total employment in Ireland. Restaurants alone are responsible for circa 72,000 of these jobs, with hotels responsible for approximately a further 54,000 of them, and rapidly growing. The industry as a whole experiences a natural attrition of 3,000 jobs that require replacing on an annual basis, due to retirement and natural migration of workers.
The Irish Hotels Federation (IHF) reports that 83% *(a figure up from 63% in 2013, and 75% February 2014)* of it's members struggled to hire suitably skilled workers to fill entry and craft level positions in 2014.

Forecast on supply and demand

In the same report it showed that 86% of IHF members reported that due to rising confidence in the industry they would be increasing their investment in refurbishments throughout 2015, and 77% reported that they would increase their investment in marketing in the coming year. These commitments to increase investment, alongside government's renewed commitments to continue to market Ireland internationally as a tourist destination and year on year increases in international visitor numbers touching 8% coupled with a booming domestic tourism trade, mean that demand for suitably skilled workers is likely to continue to grow right through to 2020 and beyond.

How can government do more?

Use the National Training Fund and Failte Ireland to establish a dedicated Hospitality training program, based on a workplace apprenticeship model

As has been proposed in the RAI's pre-budget submission for 2015, the establishment of a state facilitated Hospitality apprenticeship program could immediately see 1,000 individuals returning to education and training in a sector that is in desperate need of skilled workers.

There is merit in these proposals, and the medium-long term benefits would yield significant dividends for the government. Through Failte Ireland, government should lead and support other industry groups to develop similar programs as those proposed by the RAI, to address the needs of the market.

The workplace apprenticeship model has worked very well for the industry in the past and it does require the support of the government. A range of financial supports should also be extended to participating employers *(as well as those suggested for participating employees)* also such as tax incentives, and in appropriate circumstances the program could include a range of established employment support programs the government already has in place. The practicalities of which need to be explored in greater detail by the relative departments.

Develop a dedicated program with the specific goal to facilitate school finishers and early school leavers with a structured hospitality work placement apprenticeship scheme

A program dedicated to, and aimed at, educating and training young adults through a practical program of "earn as you learn" and institute based learning would appeal to those school leavers and finishers who feel the mainstream education system is not for them.

Through dedicated promotion of such a scheme at second level, individuals can understand the prospects that are in the hospitality industry and see past its conventionally 'unglamorous' reputation.

A structured apprenticeship of this nature will enrich young people with vital theoretical as well as practical skills and keep people who may be likely to leave education earlier in the system longer whilst exposing them to the *'real world'* earlier in life than would normally possible through traditional third level courses. It also affords them the valuable ability to decide early on their courses if the course is right for them, while providing young people with a safe and structured environment to develop much needed social skills.

Introduce a framework to deliver certification for experienced workers facilitated by industry (including it's representative groups) which can be accredited in accordance with the National Framework of Qualification (NFQ)

Many individuals enter the hospitality industry with no formal education or previous experience and develop their practical skills through years of work experience. These individuals often exact certain skills that make them proficient in their own fields. In the past, this experience was ample evidence of one's ability and to a certain extent this remains so.

However, many individuals, in particular young people, would be apprehensive to take up work in the hospitality sector if it did not coincide with their long term career plans. For the same reason, many people who **do** take up positions without previous experience do not see it as a stepping stone in their career, until they are already in the role some time.

If individuals who had gained valuable work experience 'by accident' as it were, were afforded the opportunity to retrospectively accredit that experience, they would be more likely to do so, and in turn look to develop a more long term and diverse career in the hospitality industry.

Likewise individuals who were uncertain about their career plans, who did not want to commit to a formal education programme without experiencing how the hospitality industry worked would be likely to take up a position in the hospitality sector should they know that their practical experience could be accredited at a later date should they wish to progress on such a path.

In facilitating this to be achieved through retrospective and ongoing accreditation (facilitated by industry and their representative groups); individuals can pursue higher learning with-out starting from scratch or having to enter mainstream education, which would generally involve having to leave employment.

It also will keep available spaces in full time course spaces free and open to those who require end to end education and training. Reducing the cost of training the already trained on the state.

The exact details of such a program would need to be developed by an expert group led by academia and involving enterprise and government.

Supplying the skills required to meet the needs of the Irish ICT Sector

Compiled By

Emmett Corcoran

At the request of

Deputy Michael Fitzmaurice T.D.

Summary

Supply & Demand

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What skills are in demand?

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How can government do more?

Incentivise and harbour greater partnership between 3rd level institutes and industry in order to ensure the right skills are being developed through syllabus and ensure sufficient practical experience is being gained in industry before students graduate

Continue to develop accelerated re-skilling programmes for unemployed with added incentives to focus on the ICT sector, primarily through the use of apprenticeship style programs

Extend financial incentives to individuals with an appropriate aptitude and need to avail of accelerated training and educational programmes

Increased funding and other governmental support for NGO's working to develop ICT skills in young people

Develop an on the job apprenticeship program and actively promote it to second level students in order attract them into ICT education and training straight out of school as an alternative to third level courses

Supply & Demand

Introduction

There has been ample research into *"the severely limited supply of suitably skilled applicants"* in Ireland's information and communication technology (ICT) sector. This research has been conducted by state bodies, enterprise and through academia, and in recent years all research has highlighted the severe skills shortages in our labour market.

Research carried out by the Forfas and The Expert Group on Future Skills in November of 2013 has shown that the greatest skills deficiencies in the Irish ICT sector relate to the shortage of skilled workers in; cloud computing, mobility, big data / analytics and the internet of things and the underlying enabling technologies related to the internet of things.

Due to the lack of indigenous talent in the high-level ICT sector: a study by UCD and Dublin City Council, included in a major international study by the World Class Cities Partnership in Boston, found that more than half of the ICT jobs in Dublin are being filled by talent from abroad.

This was mirrored by a study by non-profit training promotion agency, Fastrack to IT (FIT), in October which found that some 7000 jobs available in Ireland's IT sector (FIT ICT Skills Audit 2014 Report, October 2014) are not being filled because of "the severely limited supply of suitably skilled applicants". The study, based on a survey of 60 IT multinationals and SMEs, found that many of the vacancies are at the intermediate skills level, and could be filled after training programmes of six to twenty-four months.

What skills are in demand?

The FIT audit also reveals Big Data Analysis as having the highest demand for skills at expert level, whereas areas such as Networking & PC Maintenance, Contact Centre Support, and Platform Administration have a higher requirement for candidates with competent and entry level skills. Many of these IT roles and in-demand skillsets lend themselves to vocational forms of study.

Peter Davitt, CEO of FIT said, "The audit highlights that while there is strong demand in the IT industry for people with university degrees and doctorates, there are more vacancies for people with IT skills at Level 5/6 on the National Framework of Qualifications. *It also demonstrates clearly that the Further Education and Training sector has a huge role to play in addressing the immediate gap and foreseeable skills need in Ireland"*

Peter O'Neill, Managing Director IBM Ireland said, "The traditional path of going from the Leaving Certificate into four or more years of university, and then looking for a job, does not suit everyone. *We must create multiple pathways to ICT careers that are attractive to a broader range of people...*"

It is my estimation that many individuals could be benefit from accelerated programs and an intensified curriculum that would involve greater immersion in the industry through an apprenticeship style training regime *(FIT is to proceed with a pilot of the ICT Associate Professional initiative working closely with SOLAS, participating Education and Training Boards (ETBs), ETBI, ICT Ireland and the tech industry).*

Given that there are in excess of 7000 jobs that need to be filled immediately, government would benefit greatly by resourcing such programs and developing further accelerated programs. Policy makers will also need to play a role in incentivising individuals to chose accelerated programs over third level courses *(benefits of apprenticeships versus third level detailed in main body of report)*, through a range of incentives such as education vouchers, tax incentives and access to student finance so that individuals can support themselves through an intensified program.

Other key findings from the FIT skills audit 2014 include:

- 75% of immediate vacancies are for employees able to exercise skills at the competent and entry levels, compared to 25% at the expert level.
- Networking & PC Maintenance and Platform Administration disciplines remain an excellent route into the ICT sector for those with entry level skills which account for about 40% of the in-demand roles available.
- Software development is a thriving sector with strong demand for programmers across platforms especially mobile computing and a high demand for software testing skill with entry level roles on offer.
- Teamwork and multi-tasking were voted first and second most important attributes in the survey section given over entirely to softskills and professional development.

- Technology is rapidly evolving and transforming the way we live and do business and emerging technologies will continue to shape the skills needs of the ICT sector.

What is industry doing to balance skills supply and demand?

Industry has taken a very progressive stance on the matter of balancing supply and demand. Many indigenous companies and MNC's have developed close working relationships with third level institutes in order to assist them in delivering a curriculum and as a result, graduates who have the skills necessary to enter the workforce with minimal further investment.

FIT

FIT is an industry-led initiative which works in close collaboration with government departments and national education and training agencies, local development organisations and a host of community based organisations. Its primary partners in education and training include SOLAS, ETBs (formerly VECs), ETBI, ICT Ireland, Intreo, Third Level Institutions, Leargas, Leader / Partnership Companies and LESNs.

FIT's mission is to promote an inclusive Smart Economy by creating a fast track to marketable technical skills for those with the aptitude and ambition to commence a career in ICT. FIT is a registered charity and not-for-profit organisation. The Initiative develops and promotes technology-based programmes and career development opportunities for job-seekers who have become detached from the labour market in an increasingly knowledge-based economy.

ICT Ireland

The ICT Ireland Skillnet comprises a group of companies in the information and communications technologies sector who have come together specifically to provide advanced training and development activities for technical and engineering staff in Irish ICT companies. The initiative has received funding from the Irish Government through Skillnets and the companies also make a significant financial contribution.

The network is coordinated by ICT Ireland, a federation within the Irish Business and Employers Confederation. Most of the work is focused on delivering Masters level programmes in Innovation and Technology in collaboration with academic institutions as well as advanced technical training programmes through a variety of providers.

The network also supports entry to the sector for unemployed through specialised jobseeker support programmes.

In a survey carried out by Forfas and the Expert Group on Future Skills 40% of respondents believed that improvements to the education system, particularly at third level, but also through primary and secondary level, would have the greatest impact on tightening the ICT skills gap. Circa 15% of respondents felt driving a greater awareness of the opportunities available in the ICT sector would best improve the situation and a similar number felt that improving and expanding internships/apprenticeships would solve the issue.

What is government doing to assist industry in their efforts?

It is estimated that one fifth of the current available jobs are in the ICT sector, when this is compared to 2006 and figures showing 25% of young males being employed in the construction sector, it is evident that Ireland's ICT sector is rapidly growing.

An earlier FIT report from May 2013 put the estimated number of vacancies in the ICT sector at 4500, compared to their most recent October 2014 report which put them at over 7000. This is an alarming increase in the number of vacancies in one sector and government is moving to try and fill the gap but more needs to be done. The demand for high-level ICT skills will show a continuous increase with a compound annual growth
rate (CAGR) of 4.9% to 2018 (Fighting to Stay on Course).

Government agencies have been actively supporting operations such as FIT and ICT Ireland through programs such as skillnet *(which is enterprise led and funded through the national training fund NTF)* and through other funding channels.

Since June 2014 Springboard *(operated by the Higher Education Authority)* offers 6100 free places on 171 higher education courses leading to awards at certificate, degree and post-graduate level. Springboard is primarily targeted at job seekers with a previous history of employment.

The majority of courses are part-time. To be eligible to participate on a part-time Springboard course an applicant must be a jobseeker.

21 of Springboard courses on offer are free, full-time skills conversion courses in the area of Information and Communications Technology (ICT). These conversion courses are open to all suitably qualified applicants, regardless of employment status.

Many of these government programmes have experienced success, and further investment and unique approaches would yield further dividends.

The Numbers

The 2011 census reported that 100,000 people claimed to work in a ***software related*** role.

In 2011, there were 65,350 ICT professionals directly employed in Ireland. The assumptions above result in a segmentation of 40,502 ICT professionals in the broad ICT sector (62% of total) and 24,848 (38%) in other specific ICT sectors (i.e. electronic and electrical engineering).

Reports quoted above show that circa 7000 vacancies require filling at present, and that many of these jobs are being filled from abroad as a result of the skills shortages.

Forecast on supply and demand

Overall, in the Central Growth Scenario "Fighting to Stay on Course", over the period 2012 to 2018, it is estimated that there will be more than 50,000 new job openings. Of these, demand for computing skills will still be well above electronic and electrical engineering.

To 2018, it is predicted that mainstream third level institutes will cater for about 50% of the potential job openings in that period that would require level 8 qualification and greater. To 2014, mainstream channels have catered for 100% of job openings requiring level 6/7 qualification, and

it is predicated that they will cater for approximately two thirds of the opening for the remainder of the period. (Forfas & TEGFS, 2014)

This clearly indicates that unconventional training methods are going to be responsible for the facilitation of skills development over the next three years, and likely beyond 2018. That is why it is vital that alternative forms of educating and training ICT professionals need to be continued to be developed.

How can government do more?

Incentivise and harbour greater partnership between third level institutes and industry in order to ensure the right skills are being developed through syllabi and ensure sufficient practical experience is being gained in industry before students graduate

Although many firms liaise with third level institutes, many institutes still do not have curriculums that cater for delivering the skills which industry are demanding. Many courses remain outdated, and large numbers of institutes still fail to deliver on dedicated digital marketing courses.

The establishment of a government led commission with the objective of harbouring structured communication between industry and academia in order to ensure all institutions are ensuring their courses are evolving with the needs of enterprise, would serve as a long term solution to issue of skills shortages.

In particular, a greater focus on aptitude testing and early stage active learning would create greater efficiencies in courses and would ensure an improved quality of graduates.

Taking a proactive as opposed to a reactive approach to delivering the needed skills will help to minimise deficiencies in future generations of graduates.

Continue to develop accelerated re-skilling programmes for unemployed with added incentives to focus on the ICT sector, primarily through the use of apprenticeship style programs

The current programs administered through Springboard and other government agencies (SOLAS etc.) are a step in the right direction. As 75% of the current vacancies only require entry level / competent skill levels there is merit in developing programmes with the specific goal of bringing individuals with; under-developed skills and individuals with cognate skills or no skills but high aptitudes, to the minimum required level so that they can enter the workforce where many private companies will fund further education as it is required, wither through scholarships or on the job training and education.

Extend financial incentives to individuals with an appropriate aptitude and need to avail of accelerated training and educational programmes

A wide range of financial incentives would act to attract people into the ICT sector.

Tax incentives for people in cognate industries to re-skill through part time programmes would have a double barrel benefit, in that, the skills gap that is threatening our continued economic

growth would be narrowed, and individuals would be moving, generally speaking, into higher net worth jobs the result being greater tax revenues for the exchequer.

Access to state guaranteed student finance would be a vital element to the success of intensified programmes. If an individual is to be successful in gaining competency through an accelerated course, they will require financial support as they would not likely be able to sustain a part-time job.

If financial institutions were supported in offering low interest loans to individuals looking to undertake accelerated programmes, the burden of financing the education would be shifted from the state to the individuals who will benefit directly from accessing the higher education, again having a similar multi-barrel-benefit effect.

Increased funding and other governmental support for NGO's working to develop ICT skills in young people

One example of an organisation which aims to be a fix to our digital skills shortfall, particularly in the area of programming, is the advent of the CoderDojo movement. This new global movement was set up in Ireland by James Whelton and Bill Liao. 'CoderDojo is a movement orientated around running free not-for-profit coding clubs and regular sessions for young people' (coderdojo.com).

At these clubs volunteers teach kids how to code, develop websites, apps, programs, games and more. In 10 years or so Ireland could have a generation of graduates entering the workforce with the tech skills needed to make Ireland a world leader thanks to CoderDojo.

If the government can develop a framework through which NGO's such as CoderDojo can be funded and accredited, it could prove to be as significant to Ireland's academic, social and economic development as organisations such as the GAA and Community Games.

Develop an on the job apprenticeship program and actively promote it to second level students in order attract them into ICT education and training straight out of school as an alternative to third level courses

An overhaul of the Irish education system from primary all the way to tertiary is needed. The number of students entering into computing courses in Irish colleges fell from 1,809 people in 2000 to 1,427 in 2010 (Forfás, 2012). When the fact that total college students rose by nearly 50% over this time period is taken into account the fall is even more dramatic. Only 4.5% of freshmen joined a computer course in college in 2010 (Forfás, 2012). The education system is clearly not guiding young people into the sectors where there are jobs. This not only limits the future careers of these young people it also damages the future economic potential of the country and reform is needed.

A complete overhaul would take considerable time and resources, whereas the development of an alternative to third level courses could be developed by government working with industry and the NGO sector to incentivise school finishers and leavers to enter the ICT sector through hands-on programmes. Which would be accredited in accordance with the NFQ.

List of 320 Recognised Trades/Occupations for Apprenticeships in Germany:

24 Months:-

1. Tailor/Seamstress.
2. Construction finishing / expansion skilled worker - Focus carpentry work tile, Plate and mosaic work , screeding , heat, cold and noise insulation , drywall work.
3. Structural.
4. Mining and machine man / woman machines - specialized in propulsion and recovery ,Transportation and maintenance
5. Specialist Machine service
6. Wood specialist.
7. Specialist for courier, express and postal services,
8. Specialist for Leather processing
9. Specialist in metal technology - specialized in assembly technology , construction technology , machining ,Forming and wire technology
10. Specialist in the hospitality industry
11. Warehouse operative/manager
12. Bicycle mechanic
13. Construction Trade Workers / Construction Trade Worker - Focus masonry, concrete and reinforced concrete work ,Furnace and chimney construction
14. Industrial Electrician - specializing in industrial engineering , equipment and systems
15. Insulation workers
16. Machine operator / machine and plant guide - Focus metal and plastics technology, Textile Engineering , Textile finishing, food technology and paper processing
17. Fashion seamstress / tailor and dressmaker
18. Upholstery and decoration seamstress / upholstery and decoration seamstress
19. Chemical production specialist
20. Product auditor textile / fabric
21. Service specialist in dialogue marketing
22. Service Driver / rider Service
23. Service force protection and security
24. Ice cream maker / ice cream manufacturer
25. Civil engineering technicians / civil engineering skilled worker - Focus road works, pipeline construction ,

Channel construction , well and geotechnical works , railway works
26.Salesmanship

36 Months:-
27. Asphalt Bauer
28. Conditioning mechanic - Field of natural stone, ceramic and refractory
Raw materials , sand and gravel, hard coal, brown coal
29. Optometrist / Optician
30. Automatic Installer / machines specialist
31. Car salesman
32. Baker.
33. . Banker.
34. Construction Equipment Guide / equipment guide
35. Construction materials tester - Focus Geotechnical Engineering , mortar and concrete
technology, Asphalt Technology
36. Sealing operatives.
37. Mechanic for demolition and concrete cutting
38. Draftsman / Architectural Technician - Focus civil engineering, road construction and
landscaping , civil engineering , architecture
39. Mining Technologist / Mining Technologist - Department of civil engineering , drilling
technology
40. Professional drivers
41. Burial Expert
42. Concrete and reinforced concrete construction
43. Focus concrete stone and terrazzo, precast concrete
44. Concrete block and terrazzo / concrete block and Terrazzoherstellerin - Focus on concrete
block and Terrazzo , precast concrete
45. Boatmen/Boatwomen.
46. Grounds maintenance.
47. Bow makers.
48. Cooper.
49. Brewers and maltsters
50. Writer.
51. Well-builder.
52. Bookbinder.
53. Book seller.
54. Gunsmith.
55. Background artist and Performance painter and specialized in sculpture, painting
56. Office clerk
57. Brush makers / Brush maker - specialized in manufacturing brushes , brush manufacturing
58. Roofers - specialized in roof, wall and sealing technology , thatched technology
59. Distiller(Spirits)
60. Diamond grinder - Focus Industrial diamonds, diamond jewellery
61. Fields woodturning , ivory carving
62. Chemist.
63. Gemstone engraver.
64. Gemstone and Jewellery production.
65. Railwaymen in operational service / railway worker in operational service - specializing in
infrastructure , train drivers and
transport
66. Electric plant fitter / electrical system

67. Screed Layer.
68. Skilled worker for labour market services / Specialists in labour market services
69. Skilled Bath workers.
70. Skilled employees for office communication / assistant for office communication
71. Skilled employee for market and social research / Specialists in market and social research
72. Skilled worker for Media and Information Services / Specialists in media and information services- Specialized in medical documentation, archive , library , photo agency, information and documentation
73. IT Specialist - specializing in application development, system integration
74. Specialist Agricultural Services
75. Specialist for wastewater engineering
76. Specialist for fruit juice technology
77. Specialist in port logistics
78. Waste collector - Focus on waste disposal and treatment ,
Waste recovery and treatment, logistics , collection and distribution
79. Warehouseman
80. Specialist in Food Technology
81. Specialist in furniture, kitchen and removal services
82. Specialist for Pipe, Sewer and Industrial Services - Industry Focus Service, Pipe and Drain Service
83. Specialist for protection and safety
84. Specialist for Road and Traffic Engineering
85. Specialist of confectionery technology - specialized in confectionery , chocolate, confectionery,
86. Specialist for event technology - Research design and implementation , structure and organization
87. Expert for Water Supply Engineering
88. Specialist for Water
89. Specialist in driving mode
90. Expert in food service / expert systems catering
91. Salesperson in the food trade / shop assistant in the food trade - Focus Bakery, Confectionery , Meat
92. Vehicle interior designer / decorator vehicle
93. Vehicle varnisher
94. Facade Fitter
95. Production mechanics / production mechanic
96. Furnace and chimney builder / Combustion
97. Decorative moulds.
98. Film and video editor / film and video editor
99. Fish farming , lake and river fishing , Small Ocean and coastal fishing
100. Flat glass mechanic
101. Basket weaving - Focus wicker, wicker furniture
102. Butcher
103. Tile, plate and Mosaic tile,
104. Florist.
105. Forestry
106. Photographer / photographer - focus portrait photography, product photography, industrial and architectural photography ,
scientific photography
107. Photo media specialist / photo media expert
108. Barber / Stylist

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109. Gardener / teacher - specializing in nursery , cemetery flower , gardening and landscaping ,Vegetable growing , fruit growing , herbaceous plants , ornamental plants
110. Cleaners / building cleaner
111. violin maker
112. Geomatics(Mapping & Surveying)
113. Gerber.
114. Scaffolders
115. Visual marketing / designer for visual marketing
116. Glass equipment manufacturer
117. Glassblower / glassblower - Specialisation glass design , Christmas tree ornaments, artificial eyes
118. Glaziers - Field of glazing and glass construction , window and glass facade
119. Glassmakers
120. Glass processing - Field Edge and surface finishing , grinding and engraving ,Stained glass and glass art
121. Glassware.
122. Engraver
123. Harbour boatman.
124. Hand tool makers train / hand train instrument maker
125. Housekeeper
126. Wood and building protective - specialized in wood preservation and Protection
127. Woodworking mechanic
128. Wood carver / sculptor wood
129. Woodwind instrument maker
130. furniture and interior design, components, wooden packaging and frame
131. Wooden toy maker
132. Hearing care
133. Hotel business
134. Hotel clerk
135. Real Estate Agent / Property Clerk
136. Industrial insulation
137. Industrial clerk
138. Industrial ceramist Systems Engineering / Industrial Ceramic Plant Engineering
139. Industrial ceramists decoration / Industrial Ceramic decoration technique
140. Industrial ceramist model / Industrial Ceramic Model making
141. Industrial ceramist Process Engineering / Industrial Ceramic Chemical Engineering
142. Computer science clerk
143. Information and telecommunications systems electronics / information and telecommunications - Electrical Engineer
144. Information and telecommunications system in business / information and telecommunications clerk
145. Investment funds clerk/ mutual funds clerk
146. Justice skilled staff
147. Canal builder
148. Clerk for audiovisual media
149. Clerk for office communication
150. Clerk for dialogue marketing
151. Clerk for courier, express and postal services / clerk for courier, express and postal services
152. Marketing Communications / occupation of marketing communications
153. clerk for forwarding and logistics services

154. Merchant of Tourism and Recreation / clerk for Tourism and Leisure
155. Clerk of Transport Service - Focus sales and service,
Safety and Service
156. merchant for Insurance and Finance - Department of Financial advice , insurance
157. Retail clerk / Retail Services
158. Businessman in rail and road / clerk by rail and road
159. Businessman in Healthcare / clerk in health
160. Merchant in wholesale and foreign trade / purchase in wholesale and foreign trade - specialized in wholesale ,foreign trade
161. Ceramist / potter
162. Chef / cook
163. Pastry chef
164. Beautician
165. Furrier
166. Farmer
167. Light aircraft manufacturer
168. Fluorescent tube glass blower
169. Painters / painter and varnisher - Department of Building and corrosion protection , church painting and historic preservation, design and maintenance
170. Makeup artist
171. Tailors / bespoke tailor - Focus Women, Men
172. Mathematical-technical software developer / Mathematical-technical software developer
173. Mason / bricklayer
174. Mechanic for tyre vulcanization and / mechanic for tyre and vulcanization -Specialty tyre and chassis technology , vulcanisation
175. Media designer and sound / media designer Picture and Sound
176. Media designer for digital and print / media designer for digital and print - specialized in counseling and Planning, design and visualization, Design and Technology
177. media designer flexography
178. media clerk Digital and Print
179. Media Technologist print / media
180. Media Technologist pressure processing
181. Media Technologist Screen Printing
182. Medical professional staff / medical assistant
183. Bellfounding / metal- specializing in art and bell casting technique,
Metal casting technique
184. Field of gold baton technique ,and metal spinning technique
185. Brass instrument maker
186. Microtechnologist / microtechnology - Focus semiconductor technology , microsystems technology
187. Dairy Technologist
188. Dairy laboratory technician / Dairy laboratory assistant
189. Fashion cutter / tailor fashion
190. Milliner.
191. Process Technologist
in the milling and feed industry
192. Music dealer / specialist music dealer
193. Natural stone mechanic
194. Notary's clerk / notary's assistant
195. Surface coaters
196. Stove and air heating engineers

197. Orthopedics mechanic / Orthopaedic Technology - mechanic - Focus prosthetics, Individual Orthotics , Custom Rehabilitation Technology
198. Packaging Technologist
199. Paper Technologist
200. Parquet laying.
201. Patent attorney employee / patent paralegal
202. Fur Finisher.
203. Personnel services clerk
204. Horse breeding, classical riding training, Horse Racing, special types of riding
205. Plant Technologist
206. Pharmaceutical clerk / Pharmaceutical business
207. Upholsterers
208. Product designer fabric / textile
209. Production mechanic textile
210. Production Technologist
211. Product finishers textile
212. Interior / interior decorator - focusing on soil , upholstery, interior decoration , lighting, visual and Sun protection systems , wall and ceiling decoration
213. Legal and notary's clerk
214. Paralegal
215. Restaurant manager
216. Gamekeeper / Hunter area
217. Pipe fitters
218. Roller shutters and sun protection mechatronics
219. Specialist in car upholstery//Equestrian Saddlery
220. Pest controllers
221. Shipping agent / shipping clerk - specialized in tramp shipping , liner shipping
222. Sign and light advertising Manufacturer
223. Chimney sweep
224. Shoe shop
225. Shoemaker
226. Sailmaker
227. Sailor/Sailing - focus rope production , rope assembly, net assembly
228. Service businessman in the aviation / service clerk in air transport
229. Social insurance Employee / social assistant - specializing in general Health insurance , statutory accident insurance , statutory pension miners ,Social , agricultural social security
230. Special civil contractors
231. Toy Manufacturer
232. Sports and fitness administrator
233. Sports specialist
234. Forming, Stamping, Punching.
235. Stone mason and sculptor
236. Tax clerk.
237. Road Builders.
238. Road maintenance
239. Plasterer
240. Technical fabricator
241. Textile designer in the craft / textile designer in the craft - Field of felting, lace making, Embroidery, knitting , weaving
242. Textile Cleaner / dry cleaning

243. Thermometer maker / thermometer maker -Department of Oral Thermometer , Thermometer adjustment
244. Animal Medical Assistant
245. Zookeeper / zookeeper - specialized in research and clinical practice , zoo, animal shelter and kennels
246. Beekeeping , poultry farming , cattle, sheep , pigs
247. Joiner / carpenter
248. Tourism clerk
249. Drywall specialist.
250. Watchmaker
251. Event manager / Event Management
252. Process mechanic for coating technology
253. Process engineer for Ophthalmic
254. Process engineer for plastics and rubber technology
Rubber technology - specialized in molded parts , semi-finished , multi-layered rubber parts,Masterbatch production , components , composite technology , plastic window
255. process engineer Glass Technology
256. Process engineer in the mining and quarrying industry / process engineer in the stone and Earth industry - specializing in construction materials , ready- mixed concrete , gypsum board or fiber cement, sand-lime bricks
or porous concrete, precast concrete products , asphalt technology
257. Gilder.
258. Surveyor / Survey Technician - Department of Surveying, Surveying Mountain
259. Administrators, staff / administrative assistant - Department of federal , state administration ,Local government , Crafts organization and chambers of commerce ,
Church administration in the member churches of the Evangelical Church in Germany
260. Production assistants - specialized in candle making ,
261. Heating and Cooling technicians.
262. Water engineers
263. Wine technologist.
264. Plant fireman / woman
265. Winery / wine grower
266. Dental assistant
267. Carpenter
268. Plucked string instrument maker

42 Months:-
269. Plant mechanic for sanitary, heating and air-conditioning technology / systems mechanic for sanitary,
Heating and air conditioning
270. Plant Mechanic / systems mechanic
271. Vessels and equipment manufacturer
272. biology technician
273. Builder- specialized in new construction, expansion and restructuring , technology
274. Laboratory assistant.
275. Chemical assistant.
276. Surgery mechanic
277. Gem-setters
278. Electronics engineer for automation technology
279. Electronics technicians / electronic technician for industrial engineering
280. Electronics technician for building and infrastructure systems

281. Electronics technician for devices and systems
282. Electronics for Information and Systems Engineering / Electrical Engineer for Information and Systems Engineering
283. Electronics technician for motors and drive technology
284. Electronics / electronics engineer - specialized in information and telecommunications technology, automation technology ,
Energy and Building
285. Precision Optician
286. focus on mechanical engineering , precision engineering , tooling,
machining
287. Aircraft electrician
288. Aircraft Mechanic - specialized in maintenance engineering , manufacturing technology ,Engine technology
289. Specialist in Hand-mould casting , die casting machines , Printing
die casting
290. Goldsmith / goldsmith - specialized in Jewellery , Necklaces
291. Industrial Mechanic
292. Information electronics- Focus instruments and systems engineering , systems engineering office
293. Body and vehicle mechanic / body
294. Piano and harpsichord maker
295. Plumbing / plumber
296. Construction Mechanic / design mechanic
297. Motor vehicle mechatronics - Focus cars technique ,
Commercial vehicle equipment , motorcycle , systems engineering and high-voltage technology , body art
298. Paint lab assistant
299. Manufacture porcelain painter
300. Mechanic for agricultural and construction machinery
301. mechatronics engineer for refrigeration
302. Mechatronics
303. Metal worker - specialized in construction engineering, metal design , commercial vehicle
304. Organ and harmonium builder
305. Orthopaedic shoemaker
306. Pharmacist assistant.
307. Physics laboratory assistant
308. Cutting tool mechanic- Research and cutting tool Grinding Technology and knife forging
309. Silversmith / silversmith - Focus metal, enamel
310. Systems engineer / system electronics
311. Technical modeller-specialized -casting/production-body view
312. Technical Product Designer / Technical Product Designer-Product Design and its design, machine and plant construction
313. Technical System Planner - specialized in supply technology and equipment ,Steel and Metal Engineering , Electrical Systems
314. Textile laboratory technician - focus textile chemistry , textile finishing , textile engineering
315. Process engineer in the metallurgical and semi-finished industrial / process engineer in the metallurgical and Semis industry - specializing in iron and steel metallurgy, steel forming, non-ferrous metallurgy, Non-ferrous metal forming
316. Field of metal engineering, plastics engineering, heat treatment technology ,systems Engineering
317. Toolmaker

318. Dental technician
319. Machinist
320. Bicycle mechanic-Field of motorcycle technology and bicycle equipment