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1. Introduction

The report you are about to read is the result of the project entitled
'Future Skills in the Graphical Industry: Identifying and promoting best practices in Europe', in short 'Future Skills project'.
The Social partners of the Graphical and allied industries Intergraf (employers) and Uni Europa Graphical (trade unions) initiated the project in cooperation with EGIN (the European platform for education, training and labour market projects for the creative industry). The project is executed in the context of the European Social Dialogue, an initiative of the European Commission.
The Future Skills project is co-financed by the Directorate General for Employment, Social Affairs & Inclusion.

The Social Dialogue Committee for the Graphical sector has developed the 'Work Programme 2013 – 2015'[1] describing the key issues for the social dialogue.
The work plan contains, amongst others, a paragraph about "the development of skills". It notes the importance of monitoring and analysing the development of skills in order to be able to anticipate the skills requirements: "The Social partners will closely monitor the development of skills needs of the sector in order to anticipate changes in skills requirements and will discuss the education and training needs and exchange best practices."

The Future Skills project aims at developing a set of best practices of skills recognition, the analysis of skills and the development and implementation of these skills in education and training.

The best practices will be described in a generic manner. This decision has been taken to ensure 'wide applicability' in the member countries and in as many areas / sectors / regions as possible.

Most countries have different approaches for the producing educational content with a range of responsibilities various key organisations. The project does not intend to make any judgements about the existing methods and policies, nor does the project aim at prescribing or suggesting harmonisation of methods or content. The various best practices can offer a range of possibilities for the different stakeholders.
There will be possibilities to attune activities in international projects or activities in the area of skills development and application.

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[1] Social Dialogue Committee for the Graphical Sector
Work Programme 2013 – 2015, adopted in December 2012

If the best practices will lead to initiating joint projects by stakeholders of sectors, regions and countries, a second aim of the project and a key issue in the European sectoral dialogue in the Graphical industry will have been realised: sharing parts of the knowledge and expertise in discussing skills requirements and the implications for education. The best practices can then serve as a starting point for the discussions.

1.2 Contents and structure of the report
This part of the report will describe the set-up of the field research that has been conducted. The main findings and first conclusions will be described in the chapters 4, 5 and 6. The best practices will be presented in chapter 8 as case descriptions 1 and 2.

It is important to make a statement at this point of the introduction in this report about the educational terminology that has been applied. To avoid confusion about the meaning and implication of educational terminology, the project has formulated a set of working definitions that have no pretention of being scientifically correct.
The list of terminology can be found on the pages 27 - 29 of the document.

2. Present situation of the industry

The 'printing / graphical industry' has been in a state of change for at least the last decade. In a number of studies and reports the structural problems and consequent threats to the sector have been described together with the 0pportunities, recommendations and strategies to overcome those problems and be well positioned to overcome the threats.

The economic crisis has resulted in a much faster pace of restructuring of the industry. Many companies in the traditional print and finishing segment of the sector didn't have the time to restructure or have failed to take the necessary measures to survive in the future and do not exist anymore. At the same time this traditional part of the industry is also facing the problem of skilled staff shortages due to on the one hand demographical effects of a changing workforce and on the other hand staff, with their very specialised skills, leaving the industry. Furthermore this part of the sector has had little appeal to the younger generation as manufacturing industry with its 'heavy metal' equipment is not attractive and recruiting young people is a problem.

Technological developments in digital applications, software and services, such as electronic publishing and social media, form another threat to parts of the industry, whilst at the same time offering a new value chain as new, stand alone, products and services or integrated with traditional print media. Companies and employees will have to go through significant change to be able to harness the new technological developments and to integrate them into their products and services and of course work processes. The successful company of the future needs to focus on creating new added value services for the customer within the context of a full communications offering.

The transformation the sector is now facing is of a structural character but driven by technology. The relative stability provided by standard operating procedures, minimal product innovation and stable relationships with customers and suppliers has gone forever. The successful business of the future will have to very flexible to customer demands and fully au fait with new technological opportunities adapting to new situations in very short periods of time.

The situation of change as described, obviously has an enormous impact on the skills the workforce of these companies will need to have. Existing skills are being lost to companies (by virtue of an ageing workforce) and new skills are needed in order to offer the new products, services and innovations which have to be adopted to meet customer needs.
This all calls for close monitoring and analysis of skills and skills needs in the sector.
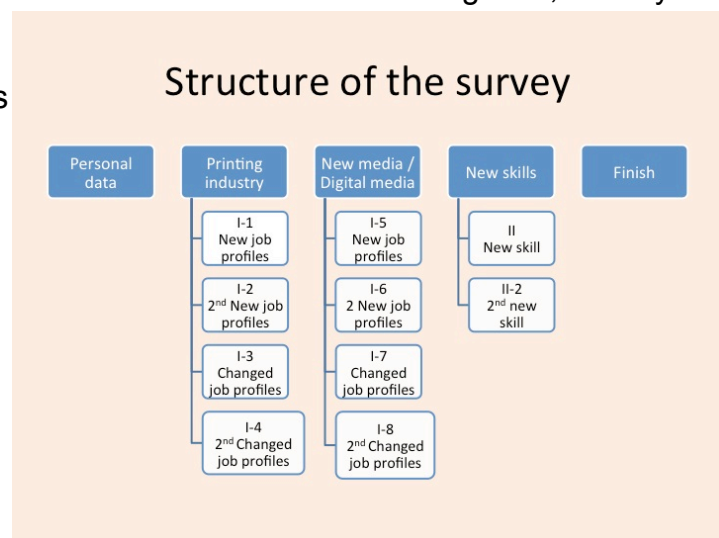
3. Field research

To get information about the processes of skills recognition and further development and implementation, an online survey was conducted in the networks of the three participating partners. The websites of Intergraf, Uni Eurpa Graphical and EGIN were used to make the survey available for the users. Additionally, the partners sent out e-mail invitations to their members and the respective networks.
The survey will be described in this chapter.

3.1 Online survey

The survey was split up in 10 'sections'; each section had its own function.
As picture 1 shows, the industry itself was divided into two sub-categories, namely the "traditional" printing industry and "new/digital media"
Each section of the survey consists this will be explained

As picture 1 indicates, questions I 1 and I 2 enquire about new profiles while questions I 3 and I 4 enquire about changed profiles. The same set up has been applied in the part about the new media / digital media industry.

Structure of the survey

Personal data	Printing industry	New media / Digital media	New skills	Finish
	I-1 New job profiles	I-5 New job profiles	II New skill	
	I-2 2nd New job profiles	I-6 2 New job profiles	II-2 2nd new skill	
	I-3 Changed job profiles	I-7 Changed job profiles		
	I-4 2nd Changed job profiles	I-8 2nd Changed job profiles		

Picture 1

New skills (as opposed to formalised job profiles) are enquired about in section II and II 2. The reason for using each set of questions twice is to give respondents the possibility to describe the development of two new profiles or two changed profiles if so desired.

Describing the industry also as new media / digital media industry has a good reason. The developments in the printing industry, going from printing to new media / digital media, is so fundamental that making a distinction is not only appropriate, but essential for the research conducted. It should describe a new sector with new products and with new services rendered by companies that have evolved into "full service" companies providing a range of services not traditionally associated with the printing industry.

3.2 Languages

The survey was developed in English language and then translated into four other languages (French, German, Italian and Spanish) in order to increase the number of respondents and give the survey bigger representativeness.

3.3 Respondents

In figure 1 the amount of respondents per language version are shown. It should be noted that the numbers per language do not resemble the country of origin of the respondents.
The countries from which reactions were received are shown in figure 2.

Language	Amount of respondents
English	87
French	4
German	44
Italian	35
Spanish	32
Total	202

Figure 1

The difference in total numbers in the figures 1 and 2 can be explained by the fact that not all respondents stated their country of origin.

Country	Amount of respondents	Country	Amount of respondents	Country	Amount of respondents
Belgium	6	Germany	21	Netherlands	14
Croatia	1	Greece	1	Norway	6
Denmark	11	Hungary	1	Portugal	2
England	5	Iceland	2	Spain	24
Estonia	4	Italy	26	Sweden	3
Finland	3	Latvia	2	Switzerland	4
France	3	Malta	6	Total	145

Figure 2

3.4 The analyses

In the next chapters the analysis of the data from the survey will be given.
The information of the identical sets of questions (as described in paragraph 2.1) has been combined in the results.

4. Analyses of the printing industry

4.1 New profiles

The name of the new profile
In order to be able to identify the developments of new profiles more precisely, respondents were asked to provide the specific name for the profile or activity.
The name 'digital printing' was given in more than 35% of the answers. That is not a surprising result as a significant number of offset printers are implementing digital printing. Therefore this particular profile has been developed in many countries over the last three years.

In this section the design / multimedia profiles / professions were mentioned in 25% of the answers. Sales and management were also mentioned in relation with cross media and the creative industry.
To quote a remark from one of the respondents: 'Prepress specialists now study more multimedia and cross media. Offset printing specialists are now studying digital printing; the names of the courses have not changed'. This quote could refer to a practical solution that is sometimes used in practice to speed up introduction of smaller new elements in educational programmes, leave the name unchanged and keep the final goals as they are.

Implementation in education and training
The results of these development projects were implemented in programmes of education and training in most of the cases. Figure 3 shows the details in which types of education the results were implemented.

In what type of education or training was this new profile implemented?		
Answer Options	**Response Percentage**	**Response Count**
Vocational education and training	74,7%	65
Continuous training / life long learning	25,3%	22
Advanced vocational education and training	21,8%	19
Higher vocational education and training (including universities)	21,8%	19
Other (please specify)	3,4%	3
	answered question	87
	skipped question	115

Figure 2

Vocational education and training and continuous VET are the dominant areas where the developed profiles were implemented.
As mentioned in the previous paragraph also managerial aspects and sales were mentioned as components that were developed in job profiles. These courses are mainly conducted in advanced and higher education.

Implementation in industry
Figure 4 (page 7) clearly shows that the main areas of implementation in the industry are pre-production and production.

This clearly resembles the present situation of the industry, being the key departments in most of the companies.
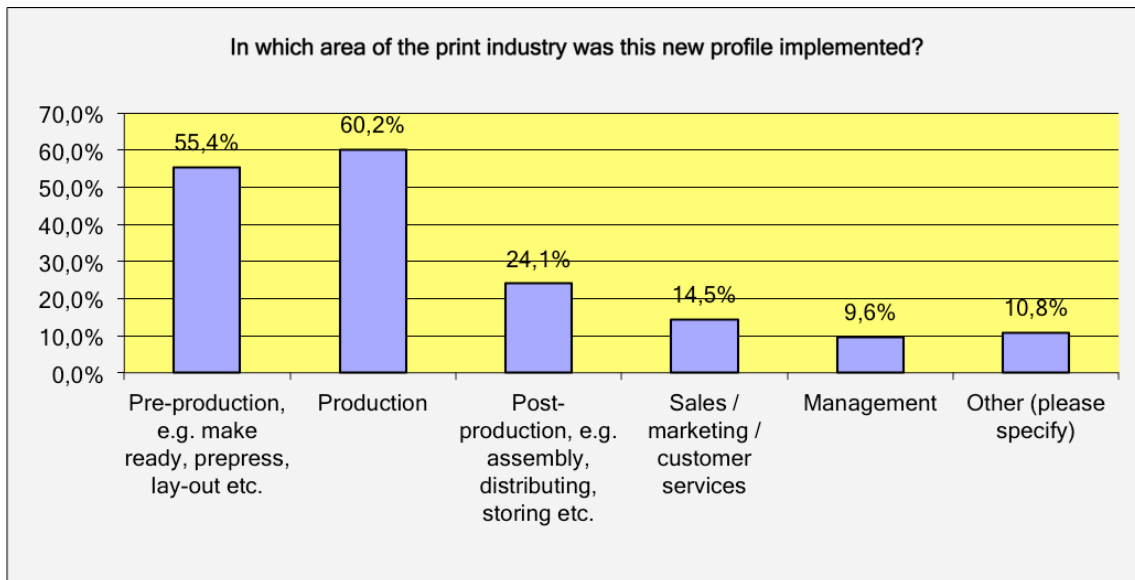

In which area of the print industry was this new profile implemented?

Figure 3

Duration of development and implementation
The time it took to develop the new profiles shows the activity of working on new profiles for education is (very) time consuming. On average it took 16 months, with highest scores of 36 to 48 months. The time needed for this kind of development is mainly due to the fact that matters need to be 'adjusted' to the official educational systems, in 2010 Cedefop, European Centre for the Development of Vocational Training came to the same conclusion[2].

The implementation of the final results in industry was not that long, but still an average of 8,5 months was needed. There is a possibility that also here the introduction in the companies may be strongly related with the possibilities and timing of the schools. Before schools can start training workers from the companies the will have to train their own trainers, get the logistics in the school organisation updated and the like.

Initiator of the development project
Employers (company owners / employers / federations) are mainly the initiators behind starting the development of skills.

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[2] Cedefop and ILO (International labour Office), Skills for green jobs, European syntheses report. National systems are slow, can cope with the normal low pace changes. When there is a need for rapid, quick change it gets more and more difficult.

Contrary to that observation, the English survey shows that schools have the initiative in 44% and employers in 39% of the cases, in the German version the employers have 68% and the schools 29% of the initiative. Spain scores 67% also with regards to employer's initiative.
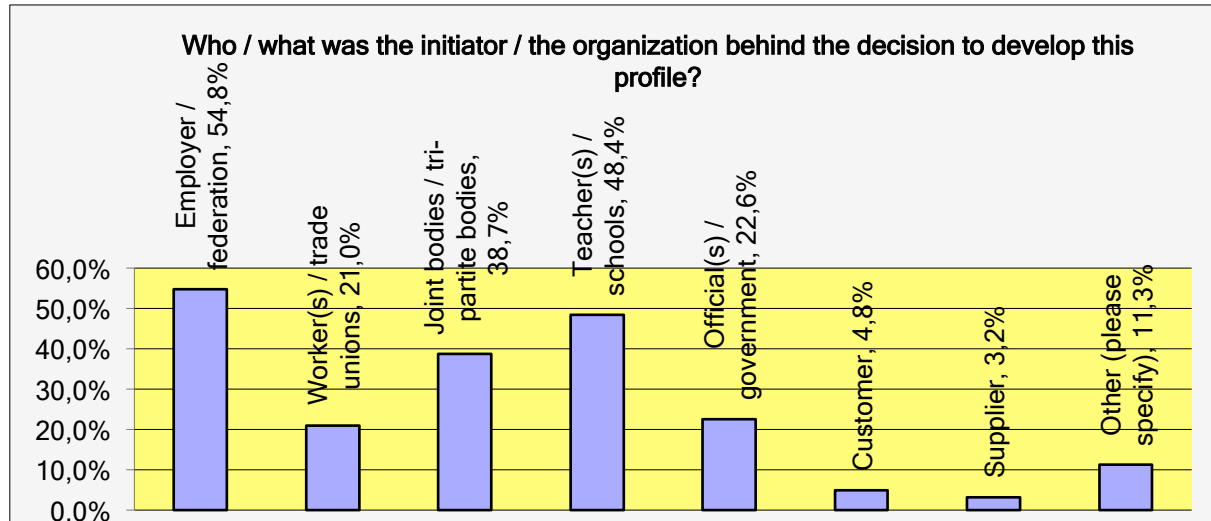Figure 5 on page 8 shows the full details.

Initiator of the project

Figure 4

Development of the profiles

Who developed the profile?		
Answer Options	Response Percentage	Response Count
Employer /employers federation	45,9%	28
Worker(s) / trade unions	32,8%	20
Joint bodies / tri-partite bodies	41,0%	25
Teacher(s) / schools	59,0%	36
Official(s) / government	26,2%	16
Customer	1,6%	1
Supplier	1,6%	1
Other (please specify)	14,8%	9
	answered question	61
	skipped question	141

Figure 5

Figure 6 shows that educational organisation are dominant in developing profiles with the other partners also participating significantly. Therefore the activity can basically be considered a joint activity.

Who had the lead in implementation?
In the actual implementation of the profile it is at the least remarkable that respondents mention the employers as leader in the process with a score of 45%. One would expect either to see schools / government here, however this does not seem to be true according to the results.

Who / what were the leading persons / organisations behind the implementation in training courses and vocational education?		
Answer Options	**Response Percentage**	**Response Count**
Employer / owner of a company / employers federation	45,0%	27
Worker (s) / trade unions	21,7%	13
Joint bodies / tri-partite bodies	43,3%	26
Teacher (s) / schools	43,3%	26
Official (s) / government	25,0%	15
Other (please specify)	13,3%	8
	answered question	60
	skipped question	142

Figure 6

Most important factor for successful implementation
The overall majority of the respondents experienced the implementation of the finished profiles as a success wit a percentage of 95%.
The main factor for this success is clearly shown in figure 8: 'The need to do it.'
Which means it was necessary that this development took place.

What was the most important factor for the success?

- The way the activity was organised / managed
- The participants in the activity
- The need to do it
- The way it was implemented
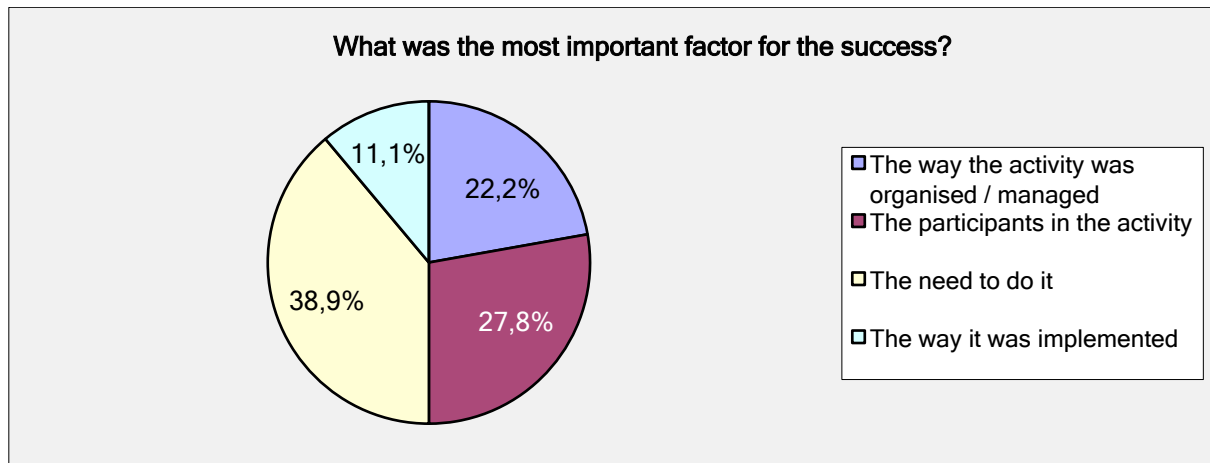
22,2%
27,8%
38,9%
11,1%

Figure 7

The respondents who were negative about the success of the activity were unanimous, 'the activity was a failure because of the way it had been managed'. For the best practices this is relevant to know, this observation has a broader baring than alone for projects with regards to the development of educational content, but also here it is of importance.

4.2 Concluding remarks on new profiles

In this part of the industry and with regards to the development of new profiles the results show a strong role for the employers as initiator of development and the driving force in implementation. In both areas also the tripartite organisations / joint bodies have a prominent role.

4.3 Changed profiles in the printing industry

The results for the next section of the survey, namely changed profiles, were almost identical to those of the previous section on new profiles. Three areas that differ will be mentioned in this paragraph.

Names of the projects to change profiles
The names or titles given by respondents to the elements that were added to or substituted existing profiles show a great variety. The list will be added as an annex to this report for further reference and identification of the specific contents. Some examples will be mentioned here to give the reader an idea of the scope: supervisor finishing / senior conductor; photographer; media developer; game artist; prepress specialists are now multimedia specialists; newspapers to E- papers; methodological competences in printing and finally master of science in printing technology.

Description of the process of changing the profile
This part gives information about the actual changes that were made to existing profiles.

The process of changing the job profile was:

- 45,7% — Extending an existing profile with new elements
- 6,5% — Deleting parts of the existing profile because it was out-dated
- 30,4% — Combining two or more existing profiles to one updated profile
- 10,9% — Adding a completely new profile
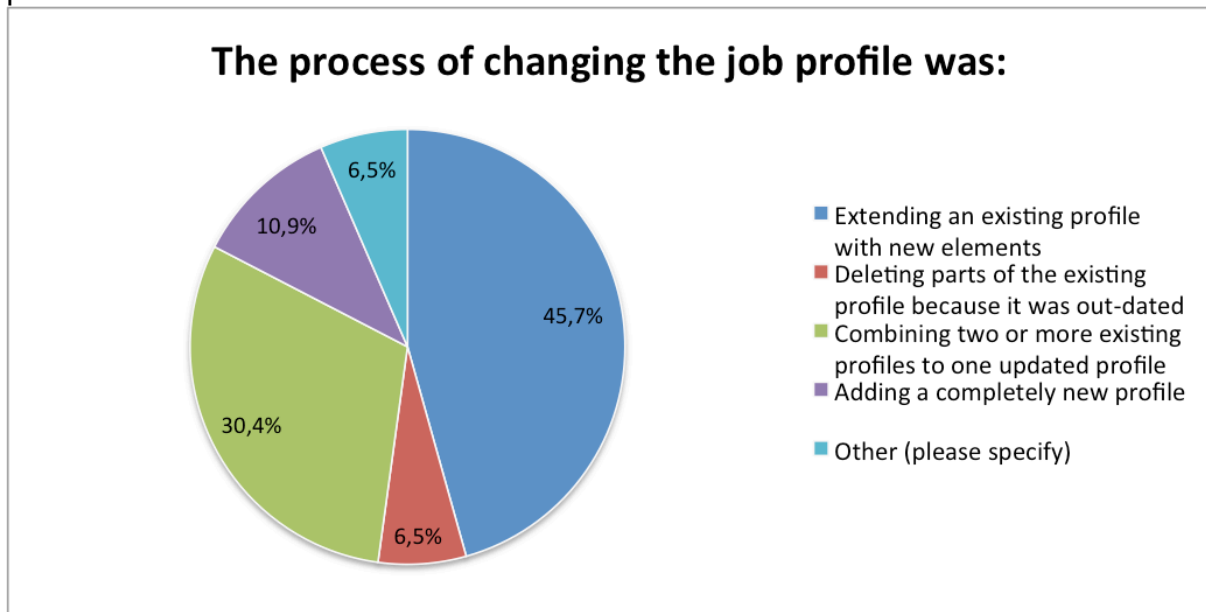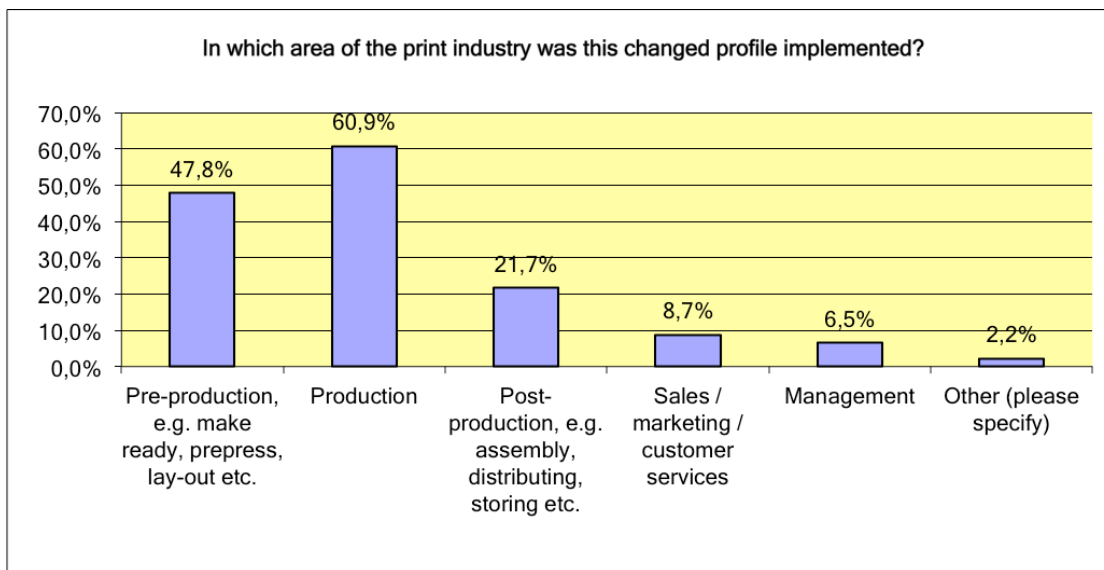- 6,5% — Other (please specify)

Figure 8

It is not remarkable that extending an existing profile with new elements takes such a high percentage, remembering the names given to the changes was already the best proof that this kind of operation would be dominant.

Combinations of profiles and adding new elements is a logical consequence of the changes[3] taking place in the print industry.

Implementation in industry
Unlike the situation with the new profiles for the printing industry where the implementation percentage between production and pre-production was almost the same (55,4% and 60,2% respectively), in this section the percentages are 47,8 and 60,9.
The survey does not give the information that could account for this difference.

In which area of the print industry was this changed profile implemented?

- Pre-production, e.g. make ready, prepress, lay-out etc.: 47,8%
- Production: 60,9%
- Post-production, e.g. assembly, distributing, storing etc.: 21,7%
- Sales / marketing / customer services: 8,7%
- Management: 6,5%
- Other (please specify): 2,2%

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[3] 'The greatest progress comes from combinations of existing technologies, rather than brand new ideas. Future innovations in printing will be incremental combinations and adaptations of existing technologies. The successful business will adapt the technology to new market conditions'. The future of the European Print Industry- in our hands: Intergraf / Uni Europa Graphical

5. Analysis of the new media industry / the digital media industry

5.1 Development of new profiles for the new media - / the digital media industry

The names of the activities
The respondents were asked to provide a title for the new profile, if possible.
The resulting list is long and will be added to the report as an annex.
Here some of the names are stated as examples: content editor; 3D skills; social media manager; project leader creative industry; game artist; e-designer and media sales person for print and digital media.

Implementation in education
When changes and new developments are implemented in the sector of industry, it will mainly be introduced as changed contents in Vocational education and training, the percentage of 72,1% illustrates that. The implementation of this new content in continuous training / life long learning is relatively low, up skilling or reskilling of workers takes place in this area of education, this needs further research.
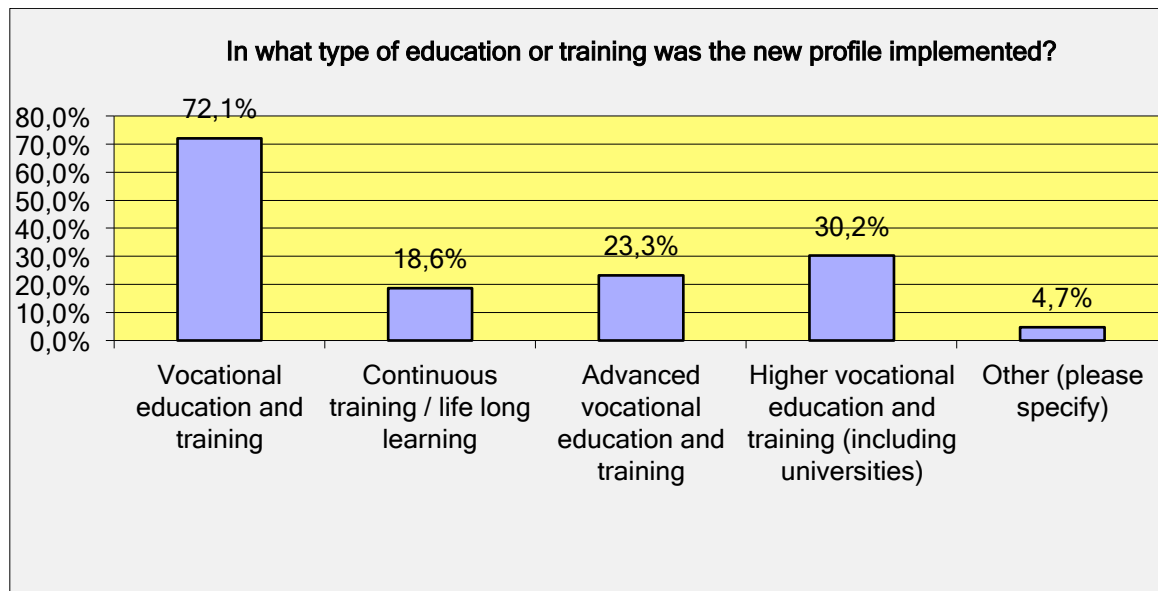

Figure 9

Implementation in industry
The profiles are implemented in most areas of the industry with little variation in percentages, Vocational Education and training with has the highest percentage also this instance 55,8%, as figure 11 on page 14 illustrates.
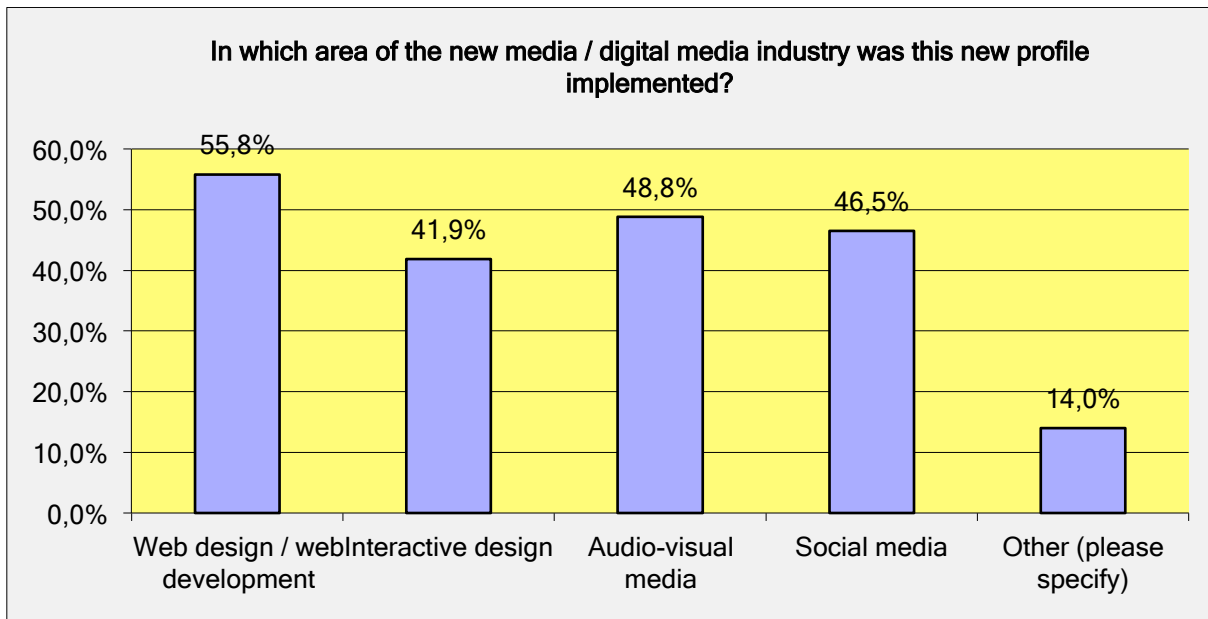
Figure 10

Duration of development and implementation
The duration to develop the changes is quite similar to the earlier sections of the survey. On average it takes 16 months.
There is a range between minimum and maximum length of duration between 2 and 36 months.
The implementation in industry shows an average duration of 7 months.

Initiator
The results of this part of the survey are significantly different from the previous ones
There we saw the employers as initiator of activities, now with new media, digital media, the educational organisations have the initiative.
The explanation for the change in pattern must be that the schools are more into the new media / social media as the students use the applications specifically developed for new and social media intensively.

Who / what was the initiator / the organisation behind the decision of the development of this profile?		
Answer Options	**Response Percentage**	**Response Count**
Employer / owner of a company / employers federation	33,3%	8
Worker(s) / trade unions	16,7%	4
Joint bodies / tri-partite bodies	37,5%	9
Teacher(s) / schools	58,3%	14
Official(s) / government	33,3%	8
Customer	4,2%	1
Supplier	4,2%	1
Other (please specify)	8,3%	2

Figure 11

Development of the profiles
As a logical consequence of the results of the initiation of the process, the schools have the lead also in developing the profiles with a percentage of 62,5%, the second highest are the employers with 37,5%.

Leading organisation for the implementation
The schools are responsible for the implementation in education for these profiles. In this sense the schools are the innovators for this kind of education.

Important factor for success
Here as well a change occurs. In the other instances the most important factor for success was 'the need to work on the new profile and the change of profiles'. Now, with new media / digital media it are 'participants in the team'.
The need to do it still takes second place, but the change is remarkable.

5.2 Concluding remarks
A significant change was noted in paragraph 4.1, the schools have the leading role on all aspects of developing and implementing the new profiles for the new media-/ the digital media industry. In all other sections of the survey the analyses showed that it were the employers who had that role.

5.3 Changed job profiles for the new media / the digital industry

Names for the activities
The names again show a range of activities and developments. Here some of the labelled activities will be stated, the rest can be found on the annex to this report. The names are: cross media and trans media lecturer; pre-press including 3 D; virtual / augmented reality producer; game developer; media designer; media graphics designer; media editing.
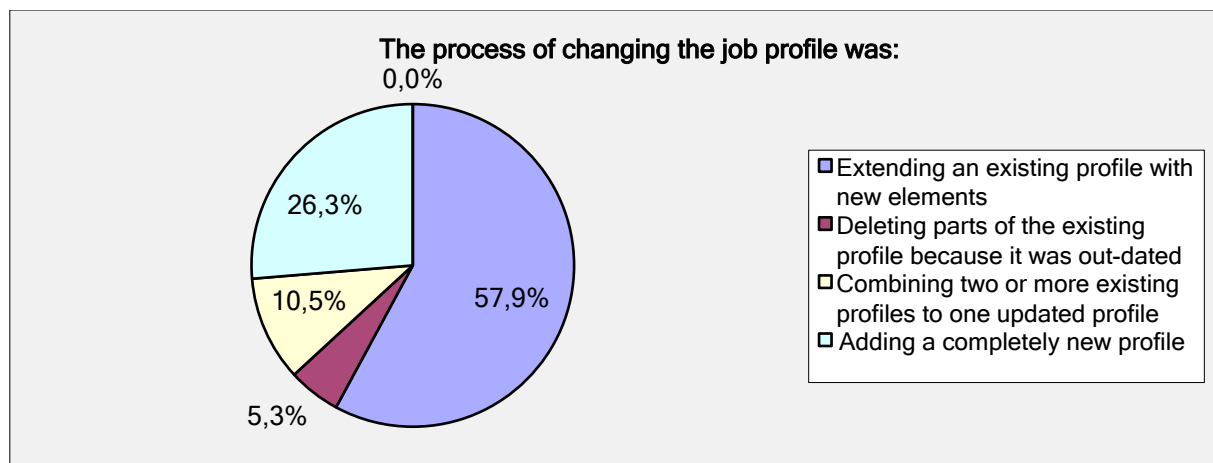

The process of changing the job profile was:

- 0,0%
- 57,9%
- 5,3%
- 10,5%
- 26,3%

Legend:
- ■ Extending an existing profile with new elements
- ■ Deleting parts of the existing profile because it was out-dated
- □ Combining two or more existing profiles to one updated profile
- □ Adding a completely new profile

Figure 12

The quality and content of existing profiles seem to be sufficient at the moment, only 5,3% of the change is deleting elements of existing material. The main area of the development is adding new elements to existing profiles. Combining profiles has a minor role with 10,5%, contrary to the printing industry where this percentage was 30,4%.

Implementation in industry

In which area of the new media / digital media industry was this changed profile implemented?

Web design / web development: 57,9%
Interactive design: 57,9%
Audio-visual media: 42,1%
Social media: 26,3%
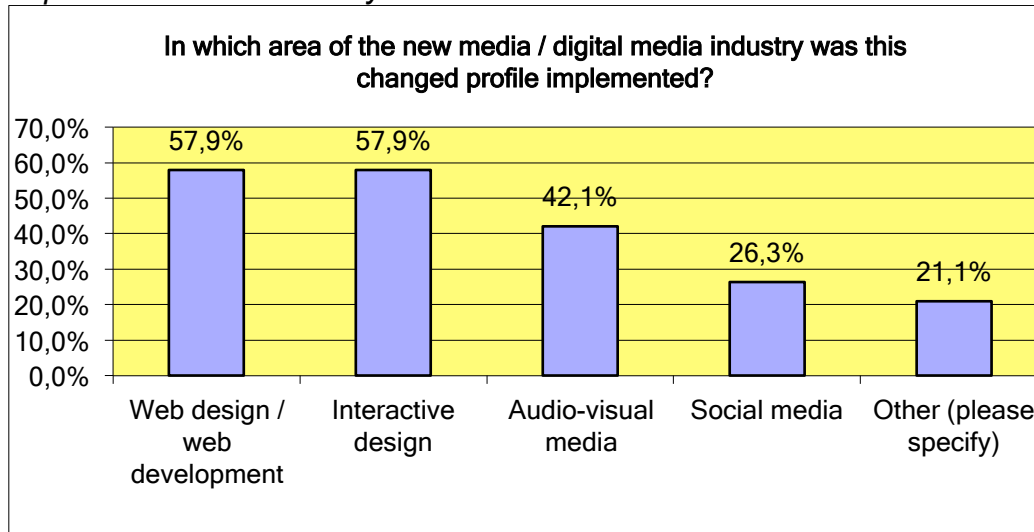Other (please specify): 21,1%

Figure 13

A difference with the results of the former section (new profiles) is the percentage of implementation of changed profiles in the audio-visual media and social media. These two elements are relatively new, either in their own existence (social media) or new to this industry and it's education.

Duration of development and implementation
At this stage in the survey the sample size has become too low to make solid statements. The average development duration is 8 months, with a large difference between the English survey with 3 months and the German version with an average of 16 months.

5.4 Concluding remarks
The concluding remarks of paragraph 4.3 will can be and will be repeated here
"It should be noted that in this section of the survey, new profiles for the media and digital media industry, a shift can be noted in the initiator, developer and implementer of the activities. This may need further research and definitely further discussion."

6. New skills

The final parts of these analyses are the new skills, smaller entities in comparison with both new and changed profiles.

61 The new skills

Names of the activities

Like in all former sections, respondents were asked to give a title to the skill they refer to. This gave a result of approximately 40 titles that were at least not identical. The full list with names can be found in the annex of the report. Here a selection of this list will be mentioned: cross media skills; database and digital publishing skills; variable data printing skills; digital asset management skills; skills to use a new technology; entrepreneurial skills, entrepreneurship; workflow engineering; interactive pdf; use of simulator Sinapse SHOTS in the education of printer apprentices; responsive design and finally teamwork.

The skill is mainly related to?

In order to come to a certain classification of the activities mentioned by the respondents they were asked to link it to a specified category or categories. This resulted in the overview shown in the Figure 15.
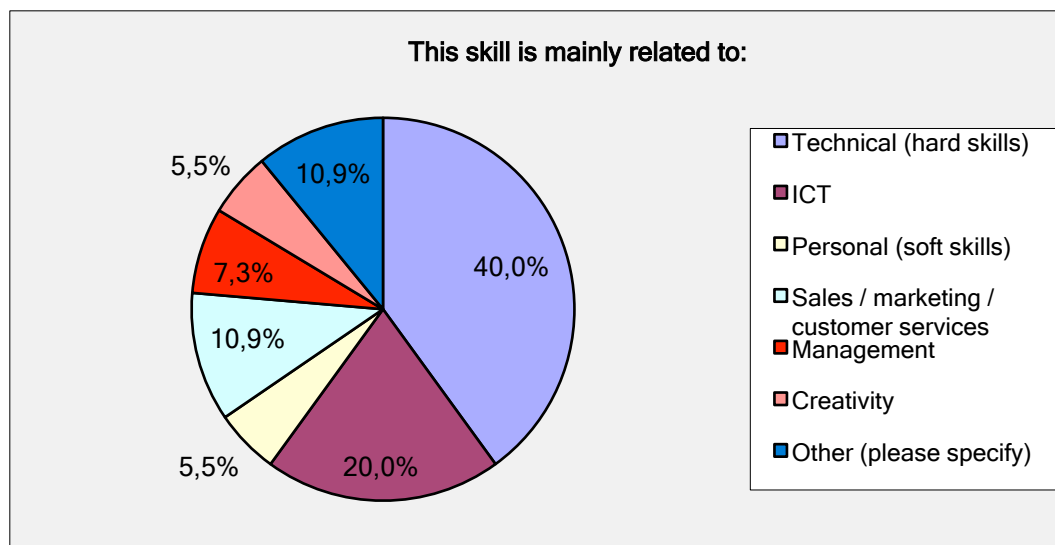

Figure 14

It is remarkable that in this area the technical hard skills have 40% of the categories mentioned. The list of names gives another impression.
There is a tendency to focus more on ICT in most likely two ways: one is the integration of ICT in machines, administrative tools, software and secondly also in production, processes in printing and also in software and application / tools used in design and digital processes.

Implementation in education

Has the skill been implemented in courses or vocational education?		
Answer Options	Response Percentage	Response Count
Yes	69,6%	39
Not yet, development is on-going	21,4%	12
No	8,9%	5
	answered question	56
	skipped question	146

Figure 15

The table shows that a relatively high percentage of the developments have actually been implemented. The next tables show in which part of the education the end products have been introduced and in which parts of the industry they are applied.

In what type of education or training was the new skill implemented?		
Answer Options	Response Percentage	Response Count
Vocational education and training	75,7%	28
Continuous training / life long learning	21,6%	8
Advanced vocational education and training	18,9%	7
Higher vocational education and training (including universities)	21,6%	8
Other (please specify)	2,7%	1
	answered question	37
	skipped question	165

Figure 16

In which area of the printing / media / communication / creative and allied industries was this new skill implemented?		
Answer Options	Response Percentage	Response Count
Web design / web development	36,0%	18
Interactive design	36,0%	18
Audio-visual media	28,0%	14
Social media	16,0%	8
Pre-production, e.g. make ready, prepress, lay-out etc.	46,0%	23
Production	52,0%	26
Post-production, e.g. assembly, distribution, storing etc.	20,0%	10
Sales / marketing / customer services	24,0%	12
Management	20,0%	10
Other (please specify)	8,0%	4

Figure 17

Figure 18 illustrates that the developments take place in a large number of segments of the industry, with a concentration on production and pre-production. The areas web development and interactive design show activities of development too.

Positive effects of the implementation of the skills
Figure 18 showed the implementation rate of almost 70% of the developed materials. The respondents were asked to give their opinion if this implementation has (had) positive effects; 97,4 % answered positively. They were also asked to give some arguments why they were positive. This resulted in a list of 30 remarks, descriptions. This list will be presented in the annex to this report.

In this paragraph some examples are mentioned:
'demand of the market is that printers know about digital workflow, color management, pdf, data handling and the like'; 'It is an area of growth and skilled people are needed'; 'with the new possibilities standardized processes for creating interactive content for web pages can be introduced. In addition, no plugins are required as with Flash' and finally 'higher qualification, development of broader competences in the profession. (Skill is an inadequate term in today's vocational education and training).'

Documentation
For this section a small amount of documents is available, 2 in English but so far they have not been located.

6.2 Concluding remarks
The area of skills development has generated valuable of information about the kinds of skills and also gives an indication why participants think this is important. It is obvious that in this section too, it is important that the participants feel there is a need that these developments take place.

7. Vocational Education and Training

7.1 Introduction
In order to develop best practices for the identification, analyses, development and implementation of skills in industry and education it is necessary to describe the context in which these activities take place. More specifically it is important to describe the role of Vocational Education and Training.

7.2 Vocational Education and Training (VET)
The role of education in society is of tremendous importance and it is for this reason that the specific roles and responsibilities of education are discussed and debated. The report will attempt to stay away from all ideological and/or political discussions. This implies that there are certain limitations to the views and readers might miss aspects that should also be taken into account. The report deals with education and the role it has due to the assignment of the European social partners and the goals of the project 'Future Skills in the Graphical Industry' which is based on the work programme of the Social Dialogue committee.

The term Vocational Education and Training is the standard term applied in almost all countries of the EU for the system that is defined as: "Education and training which aims to equip people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly on the labour market[4]".
Although the definition or description states what VET is about, there are limitations in the way its role in society is described, or at least it can be debated.
At least one dimension needs to be added to the description, especially in respect to the developments which are presently taking place at economic level in Europe.
The self-development possibilities of the person being educated should get more emphasis.

7.3 Developments in the world of education
With the strategy chosen at the outset of the survey with regards to the field research, a discussion has of course also been initiated. Respondents noted that in fact the narrow meaning or even contents of the word 'skills' has been out-dated since long. Also the use of 'profiles' would not reflect the real situation with regards the terminology in the field of Vocational Education and Training.

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[4] Source: adapted from European Training Foundation, 1997.

Of course these developments should be taken into account, however this project is not dealing with the actual content of the education, but much more with the process of creating and developing educational content. Having that role, there is no real need to first discuss extensively the exact meaning of 'skills', 'knowledge', 'competences', and if so desired 'learning outcomes'.

It should be noted, that for the monitoring of skills development and skills needs as the Social Dialogue committee has described one of its central tasks, it is needed to know about these concepts and changes in vocational education. These discussions and changes do reflect the important changes in views on education.

There is a relation between the method of delivery of educational content and the framework / structure of that contents. The method of delivery, the actual place where parts of learning take place (school vs. company) and all other contextual matters will finally be reflected in the quality assurance system. The quality system and the results of the students will have a (direct) relation with the appreciation and acceptance of the results of education and the social effect of diplomas and certificates. The EU is attempting to make these systems of certificates and diplomas as transparent as possible.

This project has to take a neutral position in these debates and developments. Trying to cover a large amount of the EU member states and of course the members of the social partners in the EU, a generic, broad based approach is a pre-requisite.

7.4 Tools for communication and understanding

The European Union has invested in recent years to develop tools to facilitate the communication about education in the member states.

It is important to understand that the tools / frameworks that will be discussed in this paragraph, have not been intended to harmonise educational content and educational outcomes nor educational systems.

DG Education and Culture launched activities in the 'European Qualifications Framework ' project in order to create a reference framework.

In the first place these programs intend to facilitate the mobility of students in Vocational Education and Training. A second initiative in this respect is the ECVET project, dealing with transparency in educational programs based on expressing the contents of it in 'leaning outcomes'.

The EQF framework describes the educational system of Europe in a framework of 8 reference levels in terms of learning outcomes: knowledge, skills and competences. The member states have developed their National Qualifications Framework (NQF) and now have the possibility to relate that to the European Qualification Framework .

Level	Knowledge	Skills	Competence
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

Picture 2

It could be a good starting point in the development of skills / profiles in either a national setting or in an international setting to determine the EQF levels or the NQF levels the targeted developments should be in, or first develop to the requirements set by the participants and later check the level in the framework(s).

8 Best practices

8.1 Description of Case 1

The first case has been developed using the outcomes and the analysis of it of the survey.

As a starting point, it should be mentioned again that it doesn't matter in this case if the development will be on skills level or professional / educational profile level. That can to be decided by the participants when the analysis has been done and the project for development of it is established.

The description is a theoretical approach: it will first serve as a model for discussion during the expert meeting. After this discussion the input from the experts will be added to the description to convert it from a theoretical model to a more operational model. After this phase it is the intention to have an interview with one or two, if needed three of the experts to make the model as realistic as possible, preferably applied in a real situation. It was not possible to get this information directly form the results of the survey.

In the survey information is asked about the possible parties that can be involved in the activities with regards to the development of skills; these parties are: employer / owner of a company / employers federation; worker(s) / trade unions; joint bodies / tri-partite bodies; teacher(s) / schools; official(s) / government; customer; supplier. Not all of these possible partners need to be involved in the development process.

In this case it is assumed that there is an organisation/network of employers and employees and at least an educational organisation that can participate in the activity at a certain stage or at specific moments.

In the survey, at the level of profiles / skills in many cases the initiative for the development was taken by an employer, most likely because certain skills are lacking (skills gap) in the company or there is a need to extending or improve existing services or initiate innovation. If so, there is a ' clear need' and the skill has been identified and analysed. The output analyses have to be checked with other possible companies or organisations that may face the same problems of have the same needs.

This is a critical point, because by engaging a larger group, more variations may enter the discussion and the originally formulated need can get blurred. So it is necessary to continuously assess if the original need is still clearly the focal point or other needs have been identified and can be taken up as a series of skills to be developed.

Managing this stage is the first key activity to success or failure. If the 'assignment' and the goal are clear it will be easier to engage appropriate partners that are needed for further development of the skill / material.

Having the assignment clear the next step should be to try to decide what the best approach for further development would be. There are different ways of having skills developed or implemented. As said in this case the initiator is an employer.

The decision should be taken if the skill will be developed with the intention to have it implemented in formal education and if so, should it be developed taking into account all issues related to the demands of formal education.

This decision is important in the search for partners and most likely for the duration of development of the product. Clearly there can be many reasons to aim for developing in formal education as there are for (first) choosing for implementation in a non-formal setting.

The final decision will mainly depend on the availability of a professional organisation for VET education (school). If that is not available, the choice is will be either a non-formal (commercial organization) or go for internal development.

If the formal route is taken (development in or with formal education) it needs to be decided what the specific roles of the participating partners are. At a certain point the responsibility could have to change from the initiator to the developing party, in this case the school.
Especially if the school / official organization has to take the lead, the initiator / employer has to decide if this is the favourable manner of operation in order still to reach the original goals
It must be noted here, that this point of decision taking at this stage will not occur when the parties that are engaged in this process have a permanent or natural cooperation in the development of education, they will know about these responsibilities from the start.

In this case the professional educational organisation has taken the role of developer and implementor, the initiating party should safeguard the role in the development of the desired content. The professional educational organisations have many official rules and regulations to obey (set by government or other educational bodies). It can easily happen that the original intentions will not be part of the final product.

In all instances it is of key importance that the participating partners / organizations cooperate in a good and efficient way and are all involved. In the results of the survey it is very clear that the people engaged in the activity were an important factor for success.
The employers and employees must realize that the formal route of development and implementation can be quite long, in average easily more than a year and for full profiles / courses it may last 2 or 3 years.
This remark is not intended to discourage persons or organizations to participate in this kind of activity, but is a fact that needs to be taken into account.

At the end of the activity the end product will have to be assessed by all parties. In case the implementation will be in for education there will be official rules and regulations that need to be implemented in order to fulfil the requirements and meet quality standards. This is the responsibility of the school and the officials, the participating parties should know about this.

8.3 Description of Case 2

Case 2 describes the situation in countries where cooperation between social partners and several professional educational organisations is a standard procedure in relation to Vocational Education and Training. In most instances this are countries that have or had quite a strong component of apprenticeship learning or a history in a dual system (now also called Work Based Learning programs). There the social partners have (taken) a responsibility in participating in the development of education, in many cases also having relations with either governmental organisations or bodies representing the government.

In this relation with the government the social partners take the responsibility for part(s) of the content of the education by providing expertise or experts for the development of education.

These countries often have professional educational organisations for research and development in the field of (vocational) education, the organisations are partially or fully funded by the government. The professional organisations have close contacts with the social partners (the social partners sometimes are the board of directors or have a representation in the board of directors), and also they have contacts with individual companies. One could almost speak of a closed circuit for educational matters.

8.3.1 Updating education is a continuous process

In these countries updating of VET is often a continuous process in that sense that monitoring the situation in education is ongoing. The industrial contacts of schools are well established. Contacts between schools and companies have a structural basis because both organisations have their own responsibility for parts of the educational program in teaching / coaching of students, either as apprentices or as interns / trainees.

The close relation between the different stakeholders do not guarantee however these countries have a much better VET education in all instances. Many other factors influence the quality of (VET) education, one being politics.

It should be noted that VET does not get high priority in financing of national education by governments.

In short, it does have positive effects when the key organisations responsible for Vocational Education have contacts on a structural basis.[5]

The social partners mostly have tripartite committees and funds for Vocational Education / apprenticeship.

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[5] This fact is acknowledged in a comparative study of ILO for the low carbon economy. "Comparative Analysis of Methods of Identification of Skill Needs on the Labour Market in Transition to the Low Carbon Economy".

These committees have tasks in performing quantitative and qualitative research in the relevant sectors of the industry. On the basis of research measures can betaken or actions are initiated to update educational programs.

In this relation the educational field keeps the social partners alert and the social partners have influence on and possibilities to update programs when needed. This is one the reason why the EU is promoting programs for WBL. The EU also sees good possibilities for extended relations between schools and workplaces (companies) in order to retrain teachers and to train workforce of the companies in short courses on the shop floor.

At this moment Work Based Learning is an important issue and will remain that for quite some time. Especially in periods of recession WBL creates an important win-win situation. Young people can learn part of their skills on the job and with that get easier access to real work in a real company. In return they are ready for work, have easier access to the labour market when leaving school and can contribute to economic growth, if the jobs are there.

8.4 Concluding remarks
The existing practice of the social partners in relation with government and professional organisations in a number of countries does have positive effects on Vocational Education and Training.

9 Terminology

Competence	The proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development.'
ECVET	The **E**uropean **C**redit System for **V**ocational **E**ducation and **T**raining. A technical framework to facilitate the transfer, recognition and accumulation of assessed learning outcomes with a view to achieving a qualification. It is designed to facilitate lifelong learning and to support the mobility of European citizens. The learning outcomes approach ensures a better understanding and comparability of qualifications and learning achievements across countries, institutions within a country or across qualifications.
Educational profile	A detailed description on the contents of education and training in order to make it possible to develop courses to enable pupils / students to perform the description of the job profile in real practice.
European Qualifications Framework	Framework for lifelong learning (EQF) provides a common reference framework that assists in comparing the national qualifications systems, frameworks and their levels. It serves as a translation device to make qualifications more readable and understandable across different countries and systems in Europe
Hard skills	Specific, teachable abilities that can be defined and measured; examples of hard skills include job skills like typing, writing, math, reading and the ability to use software programs
Job profile	A detailed description of a particular work function that includes the elements that are necessary to perform the post effectively.

Knowledge	The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual.
Learning outcomes	Learning outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course or program. In other words, learning outcomes identify what the learner will know and be able to do by the end of a course or program.
National Qualification System	All aspects of a Member State's activity related to the recognition of learning and other mechanisms that link education and training to the labour market and civil society. This includes the development and implementation of institutional arrangements and processes relating to quality assurance, assessment and the award of qualifications
National Qualifications Framework	An instrument for the classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims to integrate and coordinate national qualifications subsystems and improve the transparency, access, progression and quality of qualifications in relation to the labour market and civil society.
Skills	The ability to perform tasks and to solve problems'
Soft skills	The character traits and interpersonal skills that characterize a person's relationships with other people. Soft skills have more to do with who we are than what we know. As such, soft skills encompass the character traits that decide how well one interacts with others, and are usually a definite part of one's personality

Transversal skills	The skills individuals have which are relevant to jobs and occupations other than the ones they currently have or have recently had. These skills may also have been acquired through non-work or leisure activities or through participation in education or training.
Work Based Learning 1	Definition 1: Acquisition of knowledge and skills through carrying out – and reflecting on – tasks in a vocational context, either at the workplace (such as alternate training) or in a VET institution.
Work Based Learning 2	Definition 2: Programs for both secondary and post-secondary students, which provide opportunities to achieve employment-related competencies in the workplace. Work-based learning is often undertaken in conjunction with classroom or related learning and may take the form of work placements, work experience, workplace mentoring, instruction in general workplace competencies and broad instruction in all aspects of industry.

Future Skills in the Graphical Industry

ANNEX 2

Listing of selected answers on open (free text) questions from the survey of the project. At the start of each section respondents were asked if they knew a new profile or skill or a changed profile, and if so, to give a name to the new profile or skill.

The answers listed here are in a raw format, not edited or corrected regarding language. Parts are 'free' translations of answers given in French, German, Italian and Spanish

The list has no formal status, is added as possibly interesting for experts and interested persons in the development of skills in various EU countries.

Printing Industry
Section I 1-2 new profiles

- Interactive media designer
- Cross media sales representative
- General manager
- Project manager creative industries"
- Text writer)
- Sign Prepress specialists are studying more multimedia and cross media. Offset printing specialists are studying more digital printing. Titles of the profiles have not changed.
- Digital Print Project Manager
- Digital printing
- Digital specialist of graphical processes
- Mechatronics
- Smart printing
- Vocational qualification of Printing assistant
- It is not named due this include the mechatronics and print operator competences
- Digital printer
- Frontend developer, app developer, e-book developer, interactive media designer
- "Graphic designer for mobile apps," or something like that. Not a formal job profile.
- Media design med studiekompetanse
- 3D printing, personalized marketing/advertising
- Web designers & Programmers
- Commercial assistant for print industry
- Quality, health & safety and environmental co-ordinator
- Web to print
- Industrial production engineer with print technology engineer competence

Printing Industry
Section I 3-4 changed profiles

- Supervisor finishing , senior printer
- Photographer
- DTP, Internet at n2/3
- Media developer
- Prepress
- Graphic technician
- Printer
- Game artist
- Digital print operator
- Prepress specialist
- Prepress specialists are now also multimedia specialists
- Hi-end-printing
- Newspapers to e-Papers
- Digital graphic designer
- Further qualification of Digital Printing
- Mediegrafiker
- Offset printing operator
- Methodological competences in printing
- Designer and producer print, including digital,
- Technical designer and producer (EFA)
- E-book
- Master of science print and media technology
- Separate parts of hand bookbinding and mechanical bookbinding
- Team leader offset
- High quality corrogated packaging

New media industry / digital media industry
Section I 5-6 new profiles

- Content editor
- 3D skills
- Social Media Manager within public service broadcaster of Estonia
- Web developer
- Digital printer
- proDUCE
- Project leader creative industry
- Web integrator
- App developer
- Game developer
- Digital curation
- App Designers
- Game artist
- Liquid design
- Cross media producer (profile within independent production companies)
- E-designer
- 3D printer
- Game artist
- Technical mediadeveloper
- 3D Graphics developers, content developers and social media
- Media sales person for print and digital print
- Platforms for interactive communication
- Audio-visual media production, 3D films-interactive communication
- Technician for multi channel communication
- Augmented reality

New media industry / digital media industry
Section I 7-8 changed profiles

- Crossmedia and Transmedia lecturer
- Pre press including 3 D. it is going to be included in new education profile.
- Virtual/augmented reality producer
- Game developer
- Mediegrafiker
- Media Graphics designer
- Media editor
- Digital Instructors
- All qualifications
- Media design, will be ready in 2015
- Digital big picture printing / education
- Digital Media
- Journalist at YLE

- Social media manager

New skills

II and II 2

- Product scanning on the machines
- Digital book binder, digital printer
- App programming
- Workflow engineering
- Digital printing
- Informatics
- App/web app developer
- Entrepreneurial skills, entrepreneurship
- Interactive pdf
- Content producer
- Entrepreneurship
- Preparing content for various media output
- Use of simulator Sinapse SHOTS in education of printer apprentices
- Integrating media
- Cross media skills; database and digital publishing skills; variable data printing skills; digital asset management skills; skills to use a new technology etc.
- Use of social media
- Web Development
- 3-D printing
- Ability to work with digital equipment
- TV production
- Web development knowledge better understanding of digital printing technology
- Multitask
- Broader overview of the disciplines and working area of the cultural industry is needed
- 3D camera and Editing, Game design,
- social competences
- project planning, communication planning
- interactivity scenarios
- Design management
- Teamwork
- new substrates to be printed on in digital print
- responsive design
- sales content for book binder and screen print
- strategic management competences
- Acquisition and processing images, videos, and graphics for publication on media
- Application of tablets
- Manager (contract mangare) multichannel opertations
- Flexible packaging
- E-commerce, social use

- Specific skills on workflow in printing
- Digital resources for online editing
- Electronic publishing
- Communication