

# **Advanced Survey Report**

Editor: White Research

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## Foreword – Summary

The consortium launched an online survey targeted at health researchers who have been involved in EU research projects. The objective of the survey was to identify user groups and analyze the needs of these groups with regard to business/entrepreneurship training. 637 respondents completed the survey in full and the analysis was based solely on these samples.

The results of the survey analysis comprises of two parts: the descriptive part which contains the overview of the results for each question, and the advanced part, presented in this report, which deals with the inferential analytics. The advanced analysis employs mainstream quantitative methods and statistical software to shed light to the training targets as to facilitate the programme designers in better understanding their audience. In this respect, the findings presented here are limited to those that are in immediate practical relevance to this goal.

The report starts with the necessary information on how variables were treated. Four key variables were identified (and created) which represent a scale (or umbrella) of a number of variables, namely Commercial Awareness, Start-up Readiness, Institutional Environment and Competence. These new scaled variables were used throughout the analysis to empower and facilitate meaningful inferences.

The next chapter presents the clustering analysis which is at the heart of this analysis. We suspected early on that health researchers are a heterogeneous set of researchers made up from distinct groups which “behave” differently along the various business/entrepreneurial aspects. The cluster analysis employed the scaled variables to study unique subsets and successfully indentified six groups which differ along these broad dimensions. Three of these groups were selected as more appropriate for targeting (based on their potential and interest). These three groups share a high interest in business/entrepreneurial training (measured in terms of perceived usefulness and willingness to participate), yet show significant variations along their other three key aspects (commercial awareness, institutional environment and overall competence).

The analysis then explores a number of angles to increase our understanding of the three groups’ particularities and commonalities. We looked at every part of the survey to mine elements that would be useful for the training programme designer in order to gain a deep view of the three groups: from a detailed view on all 14 competences, to specific training preferences, to demographics and respondent experience, background, we aim to stress how these three clusters behave, their significant differentiations and points of parity.

Upon the finalization of the cluster analysis the attention turns towards the actual competences. In the survey we asked respondents to assess their competence along 14 preset areas of knowledge or skills related to the commercial exploitation of research results. These competences are an ideal independent variable as the H2M training is expected to have an immediate effect on them (increase them). Finding out which of these

competences has an important impact on other key aspects is essential for the design of the programme. All 14 competences were found to be significantly correlated to the key aspects (scaled variables); at a deeper level of analysis only a number of these competencies were identified to have a significant effect on the key aspects (e.g. which competences can have an effect on increasing Start-up Readiness).

The final chapter of the analysis attempts to analyze the barriers to entrepreneurship and commercialization. Respondents were asked on a number of preset barriers/obstacles and the analysis shows the link of these perceptions firstly to the three clusters and secondly to the key aspects (e.g. Start-up Readiness) as to establish which barriers connect to which parts of entrepreneurship/commercialization behavior and overall competence. Conclusively, the analysis tested the correlation of these barriers/obstacles to the 14 specific competences; retrospectively by affecting the right competences (through our training) we might be able to partially lift up the associated barrier(s). It has to be noted that it was not possible to get solid robust results in this respect.

*These results are representative only of this specific sample. In case limitations apply all effort is given to register them within the text.*

## Variable treatment

This section briefly describes the work at variable level in order to scale, reduce or produce new important variables from the existing initial ones.

### Reliability Analysis – Scaling

A number of questions/variables tend to measure parts of an overarching concept/entity (hereafter referred to as scaled variable). Four such meaningful scaled variables were identified and were named according to the broader dimension they are covering.

Variables in the scale	Scale Variable	Alpha
2a) Exploitability of own results	<b>Commercial Awareness</b>	.775
2b) Connecting Research to Market needs		
2c) Willingness to Commercialize		
3b) Likelihood of starting a firm	<b>Start-up Readiness</b> <i>(Does not apply to respondents who have already started-up a company)</i>	.794
3c i) Confidence for success		
3c ii) Easiness of starting-up		
3c iii) Start-up as a mean to exploit own research		
3c iv) Skilled and capable to succeed		
3d i) Successful examples in institution	<b>Institutional Environment</b>	.726
3d ii) Encouragement to pursue own ideas		
3d iii) Meeting people with new ideas for firms		
3d iv) Start-up support infrastructure		
<b>Areas of Competence:</b>		
1. Knowledge on how the (health) market operates?	<b>Competence</b>	.934
2. How to launch new products or services in the market?		
3. How to take business decisions?		
4. How does financial management work?		
5. How can you start a new business?		
6. How to search for and attract funds for a new venture?		
7. How to identify commercial opportunities?		
8. How to secure and protect intellectual property rights for your research?		
9. How to search (and utilise) data from patent information, innovation information and other sources of knowledge?		
10. Your understanding of the different ethical issues that exist in relation to your research and its utilisation?		
11. Your skills in negotiation?		
12. Your ability to identify an appropriate business model to commercialise your research?		
13. Your ability to develop a complete Business Plan?		
14. Your ability to promote the outputs of your research in front of potential clients, investors, partners?		
Perceived usefulness of Business/Entrepreneurship training	<b>Interest in Training</b>	.908
Willingness to Participate in Business/Entrepreneurship training		

These five variables are quite robust in capturing the broad perception highlighting a key area/aspect of interest; they are used as key aspects throughout the analysis. The table below summarizes the descriptive statistics for these variables that are new (and therefore not included in the descriptive report).

### Descriptive Statistics

	N	Minimum	Maximum	Mean
Commercial Awareness	637	1.00	5.00	3.4270
Start-up Readiness	486	1.00	4.80	2.6667
Institutional Support	637	1.00	5.00	2.7268
Overall Competence	637	1.00	5.00	2.8344
Interest in Training	637	1.00	5.00	3.3736

### Variables merged

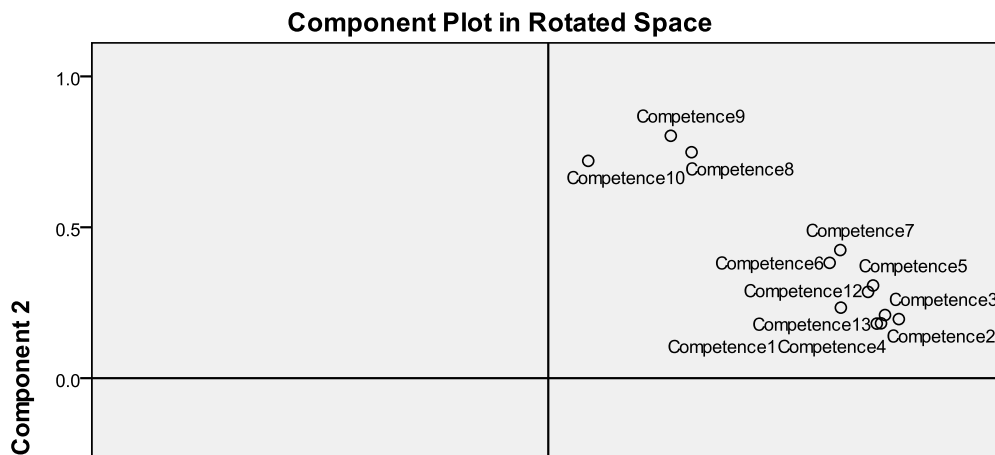
“Perceived usefulness of business training” and “Willingness to participate in business training” were merged for both the respondents that had or did not have previous business training. These new items were used in the scale “Interest in Training”.

### Factor Analysis

Two main factors appear in the competences (part two of the survey):

- **Factor 1:** Competences 1-7, 12, 13
- **Factor 2:** Competences 8,9,10
  8. How to secure and protect intellectual property rights for your research?
  9. How to search (and utilize) data from patent information, innovation information and other sources of knowledge?
  10. Your understanding of the different ethical issues that exist in relation to your research and its utilization?

Competences 11 and 14 are loosely attached to the two factors and have a poor overall factor loading (communality extraction). The graph below visualizes the two factors with these two competences omitted.



## Cluster Analysis

The main target audience for H2M is health researchers who have received EC funding. Although this seems like a homogenous group, this analysis aims to identify finer constructs and groupings based on the different relevant and important aspects with regard to training. We have identified 6 broad groups within our sample that differ along the four key aspects, out of which three were selected as more attractive target groups. The analysis then proceeds with identifying and detailing the differences and commonalities of these segments.

### Determining the groups

The primary goal of the analysis is to identify unique groups among our audience. Our approach is to group respondents meaningfully as to better understand their training needs and attitudes providing useful information for the H2M training programme designers.

The main clustering exercise employed the four key scaled variables: Competence, Commercial Awareness, Institutional Support and Interest in Training<sup>1</sup>. These scale-variables are based on 28 variables, giving an excellent overview of different aspects and perceptions. The table below presents the six clusters identified along these four multi-variable dimensions and presents the mean scores of each cluster on each dimension (1 is the minimum, 5 is the maximum). The mean for each dimension is also presented in the final column. Every score that is below the score 3 (the “average” in the 1-5 Likert scale used in the survey) is marked with red; those that are above three are marked light green.

	Cluster						Mean
	1	2	3	4	5	6	
Competence	3,0	3,0	2,3	3,4	3,5	2,1	2,8
Commercial Awareness	3,5	4,0	2,9	4,0	4,1	2,3	2,7
Institutional Environment	3,5	2,2	2,5	2,2	3,6	2,2	3,4
Interest in Training	2,8	4,4	3,7	2,4	4,2	1,7	3,4
<i>Cluster Size</i>	<i>105</i>	<i>123</i>	<i>139</i>	<i>60</i>	<i>119</i>	<i>91</i>	

**Cluster 1** is made of respondents with above average competence who have a strong commercial awareness and enjoy an average support from their environment yet have a rather low interest in training.

**Cluster 2** shows an above-average competence and strong market orientation. Their environment, however, is not very supportive and cluster 2 respondents are very interested in receiving training.<sup>2</sup>

<sup>1</sup> Start-up Readiness was not included as not to exclude those who have started-up a company.

<sup>2</sup> No significant link was found throughout the analysis between institutional environment and Interest in training. Simpler put we cannot argue that low support from the institutional environment has an effect on interest in training.

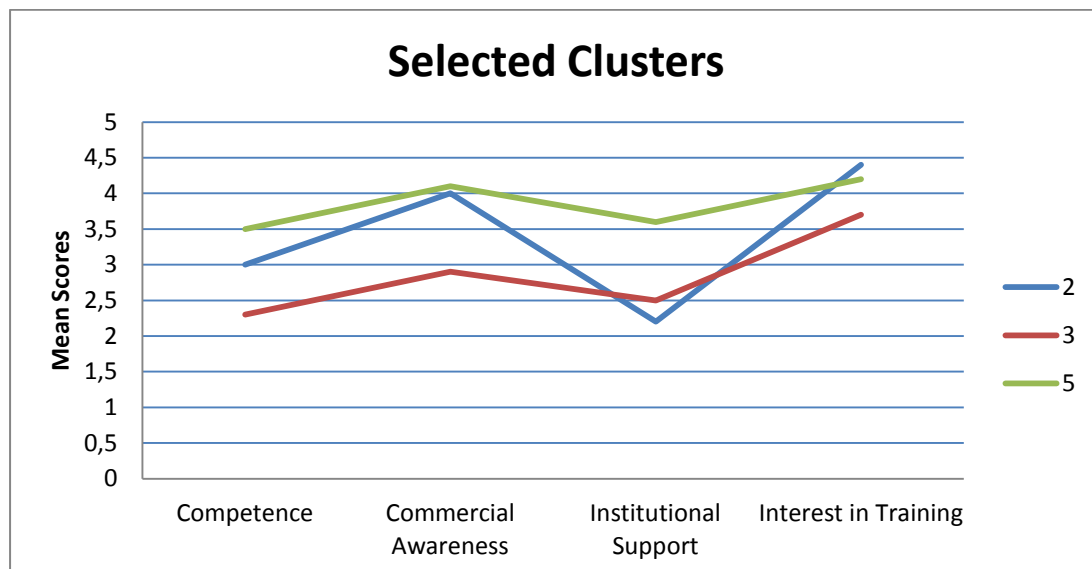
**Cluster 3** scores poorly in competence and institutional environment. The respondents show moderate commercial awareness and show an above average interest in training.

**Cluster 4** is a very competent segment with high commercial awareness which does not enjoy a supportive environment. Nevertheless they show very little interest in training.

**Cluster 5** is an elite segment with strong competence, commercial awareness and it operates in a very supportive institutional environment. They have a strong interest for training.

**Cluster 6** scores very low along all key dimensions.

From these 6 clusters, clusters 2, 3 and 5 seem to have the most potential with regard to our training. These three clusters all have high interest in receiving training but differ significantly along the other three axes, suggesting that our approach, training service and expected impact should differ.



Cluster 3 scores very low on competence, scores a bit higher than the average on commercial awareness and scores short on institutional support yet they declare a solid interest in receiving training.

Cluster 2 scores above average in competence and has a solid commercial awareness. This group receives very little support from their institutional environment and is likely to welcome our training.

Cluster 5 is an elite segment with high competence, awareness and support that shows great interest in training. Cluster 5 has a similar competence and awareness as cluster 4, yet the latter falls short on both institutional support and interest in business training.

Cluster 1 and 6 are less appealing for H2M. Cluster 1 has similar scores to Cluster 2 in competence and awareness, but has a more supportive institutional environment and its members care little about business training. Cluster 6 consists of people who score low on all dimensions and have very little interest in business training.



## Experience in start-ups and training

The allocation of both respondents who have started a company and respondents who have received business training differs significantly (sig .000) along the clusters. Cluster 5 has significantly more respondents who have started a company and respondents with previous business training.

Clusters 6 and 3 have the least percentage of respondents who have started a company (1.1% and 9.4% respectively) and the least percentage of respondents with previous business training (5.5% and 15,8%). Cluster 2 has a higher than average percentage of both respondents who have previously started a company and respondents who have previous training experience.

## Competences

The three clusters show the same low-medium-high distribution of competence along most of the areas measured in the survey. Cluster 3 scores steadily lower, Cluster 2 scores rather higher than the average, while cluster 5 scores higher. It should be noted that in competences 10, 11 and 14, clusters 2 and 5 scores are closer to each other than in the other competencies. These competences do not belong to the main factor (factor 1) identified in the previous analysis (competence 10 belongs to factor 2, competences 11 and 14 were not classified to either factor).

Competence	Clusters and Means						Total
	1	2	3	4	5	6	
1. Knowledge on how the (health) market operates?	3,0	3,0	2,3	3,3	3,4	2,0	2,8
2. How to launch new products or services in the market?	2,4	2,5	1,9	3,0	3,1	1,6	2,4
3. How to take business decisions?	2,9	2,9	2,2	3,3	3,5	1,9	2,8
4. How does financial management work?	2,7	2,7	2,1	3,3	3,1	1,9	2,6
5. How can you start a new business?	2,8	2,7	2,0	3,1	3,3	1,6	2,5
6. How to search for and attract funds for a new venture?	2,8	2,8	2,1	3,1	3,4	1,8	2,6
7. How to identify commercial opportunities?	2,9	3,0	2,2	3,4	3,6	1,9	2,8
8. How to secure and protect intellectual property rights for your research?	3,4	3,0	2,5	3,7	3,7	2,3	3,0
9. How to search (and utilise) data from patent information, innovation information and other sources of knowledge?	3,1	3,0	2,4	3,4	3,5	2,1	2,9
10. Your understanding of the different ethical issues that exist in relation to your research and its utilisation?	3,7	<b>3,7</b>	3,1	3,7	<b>3,8</b>	3,2	3,5
11. Your skills in negotiation?	3,4	<b>3,5</b>	2,7	3,6	<b>3,6</b>	2,8	3,2
12. Your ability to identify an appropriate business model to commercialise your research?	2,8	2,9	2,1	3,4	3,5	1,8	2,7
13. Your ability to develop a complete Business Plan?	2,7	2,6	2,1	3,3	3,4	1,7	2,6
14. Your ability to promote the outputs of your research in front of potential clients, investors, partners?	3,4	<b>3,5</b>	2,7	3,9	<b>3,8</b>	2,4	3,2

The above table is suitable for assessing the areas that each segment is relatively weaker signaling room for improvement. It can also be inferred that in those areas of small inter-cluster differences a common training approach is likely to be efficient. Nevertheless, these inferences should take into consideration that these self-reported assessments might be highly subjective and therefore should not be used alone in programme design.

## Cluster Demographics

Clusters 2,3 and 5 do not differ significantly along gender (.110) or research experience (.376). No significant difference in the country where respondents work was noted (.189). In the annex a list of countries per cluster is available.

Clusters differ significantly along type of organization (.000). Respondents in Clusters 2 and 3 are predominantly working in public organizations; cluster 5 has a significantly higher percentage of respondents from private organizations.

Significant differences among the three clusters are also found in the respondents affiliations (.000). Cluster 3 has a large concentration of academics, while Cluster 5 has a higher percentage of respondents from SMEs (see Annex).

Differences were found among the clusters with regard to the EU project experience of the respondents (.021). Cluster 3 has a larger concentration of people with less than two years EU project experience. Clusters 2 and 5 have similar analogies and their respondents are more senior in this respect to those of Cluster 3.

## Patents, licensing out and product development

The three clusters have significant differences along patent application, licensing out and product/prototype development. Respondents of cluster 5 are more likely to have applied for a patent and to have initiated licensing out. Cluster 5 respondents are also more likely to have produced a prototype/product. Half of Cluster 2 respondents have applied for a patent and more than half (55,3%) have already developed a prototype/product. Cluster 3 clearly lacks in all three aspects in comparison to clusters 2 and 5.

## Training preferences

The preferences of the respondents of the three clusters towards the training mode (offline Vs Face to face) do not differ significantly (.179). The cross-table below shows the percentages of the respondents along training mode options and cluster. The results suggest that the online-based modes are rather less appealing, while the blended approach (50%/50%) is the most preferred.

Training Mode	Clusters			Total
	2	3	5	
100% Online	6%	4%	5%	5%
75% Online 25 % Face to Face	5%	13%	10%	9%
50% Online 50% Face to Face	33%	39%	27%	33%

Training Mode	Clusters			Total
	31%	22%	32%	
25% Online 75% Face to Face	31%	22%	32%	28%
100 Face to Face	26%	23%	26%	25%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Willingness to travel to follow business training differs slightly along the three clusters (.009). Respondents from Cluster 3 seem less flexible although the overall willingness (cross-cluster) is rather high (e.g. 52.8% are ready to travel internationally).

Time devotion varies along the three clusters. Cluster 3 seems less willing to invest time in training in contrast to Cluster 2 which is constantly more willing to invest their time in research along the three proposed modes (one day (.023), two day (.000), five days training (.000)).

	Clusters			Total
	2	3	5	
<b>One Day Seminar</b>	3,8	3,4	3,5	3,6
<b>Two Day Seminar</b>	3,9	3,4	3,8	3,7
<b>Five day Workshop</b>	3,2	2,5	3,0	2,9

Table 1 Means for different training time options

## Perceived Usefulness of business training

Significant differences were identified in how respondents from the three clusters perceive the usefulness of business training. The analysis reveals a steady pattern along both the overall perceived usefulness and the three preset dimensions of usefulness. Cluster 2 has a higher perceived usefulness overall and of business knowledge, hands on training and networking. These differences are less apparent in the usefulness of networking opportunities where the opinion of clusters 2 and 5 are very close.

	Clusters			Total
	2	3	5	
<b>Perceived Usefulness of business training</b>	4,4	3,7	4,2	4,1
<b>Business Knowledge</b>	4,3	4,0	4,2	4,2
<b>Hands on training</b>	4,3	3,9	4,1	4,1
<b>Networking Opportunities</b>	4,3	4,0	4,3	4,2

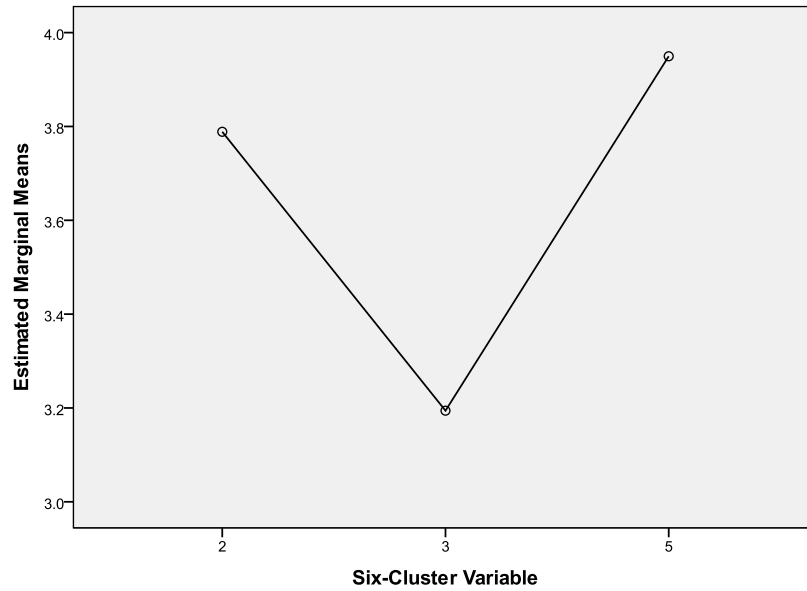
Table 2 Means of perceived usefulness along clusters

## Research results aims and differences in perceptions

Respondents were asked about their belief about the aim of research results. All three clusters share similar beliefs towards producing publications and providing solutions to health issues as goals for research results (.095 and .950). Significant differences, however,

were identified in “Commercializing health related products, devices and services” (.000). As can be expected, cluster 5 has a much stronger market orientation in comparison to cluster 3 and, to a lesser extent, cluster 2.

**Estimated Marginal Means of Commercialising health related products, devices, services**



## Analysis of Competences – areas of training

In order to be able to make a distinction among the most important areas of training, we searched for meaningful links among key variables and the fourteen preset competences.

The table below shows the correlations of the 14 preset competences with the main scaled variables. Most competences are significantly correlated to all of the key variables with some variance in strength of correlation. This makes it hard to make inferences on which competences could be more relevant for some specific aspects. Overall, the highest correlation appears between Competence (overall) and Personal Confidence (.592) and Startup Readiness (.552); a rather less strong correlation exists between competence and interest in training.

Correlations		Institutional Support	Commercial Awareness	Interest in Training	Startup Readiness
Competence 1	Pearson Correlation	,248	,383	,198	,395
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 2	Pearson Correlation	,235	,435	,219	,460
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 3	Pearson Correlation	,221	,385	,179	,498
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 4	Pearson Correlation	,201	,307	,099	,382
	<i>Sig. (2-tailed)</i>	,000	,000	,013	,000
Competence 5	Pearson Correlation	,310	,416	,184	,529
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 6	Pearson Correlation	,273	,349	,176	,417
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 7	Pearson Correlation	,246	,451	,195	,438
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 8	Pearson Correlation	,271	,388	,090	,290
	<i>Sig. (2-tailed)</i>	,000	,000	,023	,000
Competence 9	Pearson Correlation	,224	,362	,097	,289
	<i>Sig. (2-tailed)</i>	,000	,000	,014	,000
Competence 10	Pearson Correlation	,119	,144	,069	,141
	<i>Sig. (2-tailed)</i>	,003	,000	,082	,002
Competence 11	Pearson Correlation	,133	,207	,118	,378
	<i>Sig. (2-tailed)</i>	,001	,000	,003	,000
Competence 12	Pearson Correlation	,224	,421	,212	,529
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 13	Pearson Correlation	,242	,349	,176	,458
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
Competence 14	Pearson Correlation	,185	,370	,184	,406
	<i>Sig. (2-tailed)</i>	,000	,000	,000	,000
<b>Competence Overall</b>	<b>Pearson Correlation</b>	<b>,306</b>	<b>,485</b>	<b>,213</b>	<b>,552</b>
	<b><i>Sig. (2-tailed)</i></b>	<b>,000</b>	<b>,000</b>	<b>,000</b>	<b>,000</b>

The same links were further investigated at a more in-depth level (linear regression). For each key variable we tested all 14 competences for significant effects ( $t > \pm 2$ ,  $p < 0.05$ ) on the dependent variables. The table below lists the important competences for each key variable. Within brackets are the independent variables that have a negative influence over the dependent variable.

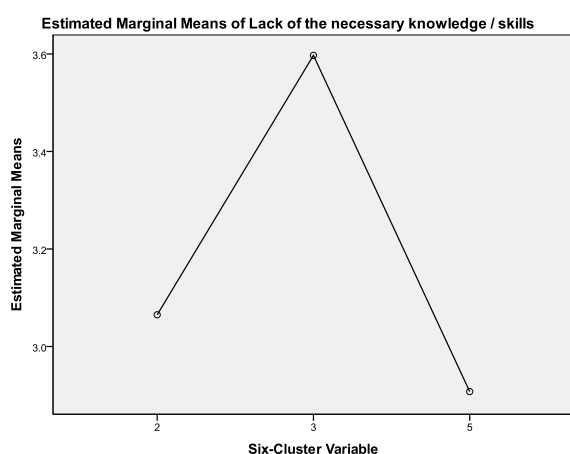
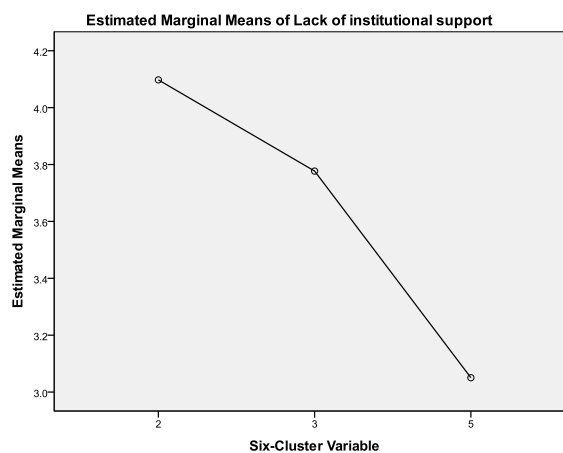
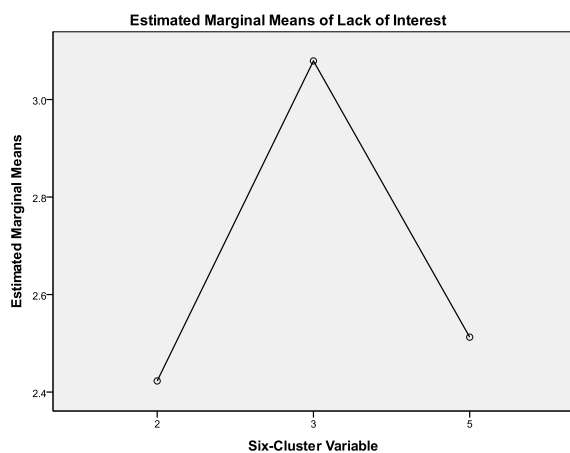
Dependent Variable	Independent Variables	R <sup>2</sup>
Personal Confidence <sup>3</sup>	How to take business decisions? How can you start a new business? Your skills in negotiation? Your ability to identify an appropriate business model to commercialize your research?	.417
Commercial Awareness	How to launch new products or services in the market? How can you start a new business? How to identify commercial opportunities? How to secure and protect intellectual property rights for your research? (Your skills in negotiation?) Your ability to identify an appropriate business model to commercialize your research? Your ability to promote the outputs of your research in front of potential clients, investors, partners?	.303
Interest in Training	(How does financial management work?)	.078
Start-up Readiness	How to take business decisions? (How does financial management work?) How can you start a new business? Your ability to identify an appropriate business model to commercialize your research? Your ability to promote the outputs of your research in front of potential clients, investors, partners?	.384

It should be noted that the fit of the model for “Interest in Training” is rather weak and these results are not to be taken into consideration. It is also noteworthy that these multivariate models only incorporate the 14 competences as explanatory variables; other independent variables might have stronger effects. Nevertheless the evidence can be helpful on deciding which areas to target based on what specific objectives the training should aim for (e.g. boost Start-up Readiness).

### Obstacles in commercialization and levers to lift them

Respondents were asked to agree or disagree to whether several preset obstacles or barriers could prohibit them from commercializing their research. The three clusters shared similar opinions towards lack of funding and (overall) significant risks; their opinions differed significantly along three other obstacles: lack of interest, lack of institutional support and lack of necessary knowledge and skills:

<sup>3</sup> Refers to a subset of the scaled variable “Start-up Readiness” that does not include 3b and 3ciii



As can be seen by the graphs, cluster 1 tends to see lack of interest as an obstacle and is worried about their lack of knowledge and skills. Cluster 2 is particularly troubled about the lack of institutional support.

In the next step we assess the potential impact of these obstacles on key variables: are these obstacles linked with other aspects? In the table below the important

correlations (marked with light green) reveal that there is a link among these obstacles/barriers and some of the key aspects (e.g. start-up readiness). For example those that consider lack of institutional support as a barrier tend to find business training more interesting. Similarly, those with lower overall competence are more likely to see lack of necessary skills as a barrier (and vice versa). The overall picture suggests that these barriers are rather linked to key training aspects and it might be beneficial to try to lift them.<sup>4</sup>

#### Correlations

		Lack of Interest	Lack of institutional support	Lack of the necessary knowledge / skills	Lack of funding	Significant risks
<b>Overall Competence</b>	Pearson Correlation	-,185	-,110	-,332	,003	-,117
	Sig. (2-tailed)	,000	,005	,000	,944	,003
<b>Commercial Awareness</b>	Pearson Correlation	-,335	-,048	-,159	,240	,019
	Sig. (2-tailed)	,000	,225	,000	,000	,627
<b>Interest in Business Training</b>	Pearson Correlation	-,237	,153	-,040	,233	,039
	Sig. (2-tailed)	,000	,000	,313	,000	,329
<b>Start-up Readiness</b>	Pearson Correlation	-,269	,073	-,267	,079	-,132
	Sig. (2-tailed)	,000	,109	,000	,080	,003

<sup>4</sup> OLS Models wield interesting results but were not included in this report as they are out of scope.

The final step is to identify those competencies that might be associated with these barriers. Competence in certain knowledge areas is something that our training programme can impact and therefore training could indirectly assist in partially lifting these barriers.

In the table below the significant correlations among competences and barriers are marked with light green (insignificant correlations are marked with light pink).

#### Correlations

		Lack of Interest	Lack of institutional support	Lack of the knowledge / skills	Lack of funding	Significant risks
Competence1	Pearson Correlation	-,164	-,105	-,253	-,036	-,092
	Sig. (2-tailed)	,000	,008	,000	,358	,021
Competence2	Pearson Correlation	-,174	-,107	-,276	,002	-,061
	Sig. (2-tailed)	,000	,007	,000	,964	,124
Competence3	Pearson Correlation	-,121	-,050	-,278	,021	-,093
	Sig. (2-tailed)	,002	,203	,000	,602	,019
Competence4	Pearson Correlation	-,092	-,097	-,244	-,065	-,101
	Sig. (2-tailed)	,021	,014	,000	,103	,011
Competence5	Pearson Correlation	-,150	-,136	-,266	,000	-,126
	Sig. (2-tailed)	,000	,001	,000	,990	,001
Competence6	Pearson Correlation	-,148	-,082	-,253	-,014	-,163
	Sig. (2-tailed)	,000	,038	,000	,733	,000
Competence7	Pearson Correlation	-,201	-,115	-,242	,020	-,053
	Sig. (2-tailed)	,000	,004	,000	,617	,180
Competence8	Pearson Correlation	-,116	-,154	-,240	-,016	-,013
	Sig. (2-tailed)	,003	,000	,000	,679	,745
Competence9	Pearson Correlation	-,090	-,063	-,207	,053	-,041
	Sig. (2-tailed)	,024	,111	,000	,181	,298
Competence10	Pearson Correlation	-,012	,000	-,149	-,005	-,113
	Sig. (2-tailed)	,761	,993	,000	,909	,004
Competence11	Pearson Correlation	-,060	-,005	-,190	-,014	-,078
	Sig. (2-tailed)	,130	,895	,000	,725	,049
Competence12	Pearson Correlation	-,190	-,053	-,306	,033	-,103
	Sig. (2-tailed)	,000	,185	,000	,399	,009
Competence13	Pearson Correlation	-,165	-,079	-,270	,046	-,077
	Sig. (2-tailed)	,000	,047	,000	,250	,053
Competence14	Pearson Correlation	-,208	-,076	-,236	-,005	-,103
	Sig. (2-tailed)	,000	,054	,000	,906	,009
<b>Overall Competence</b>	<b>Pearson Correlation</b>	<b>-,185</b>	<b>-,110</b>	<b>-,332</b>	<b>,003</b>	<b>-,117</b>
	<b>Sig. (2-tailed)</b>	<b>,000</b>	<b>,005</b>	<b>,000</b>	<b>,944</b>	<b>,003</b>

The barrier of lack of funding is not correlated to any competence (despite perhaps the expectation of a link to Competence 6: how to search and attract funding for a new venture). The rather obvious negative correlation of competence and lack of necessary



knowledge and skills is relevant for Cluster 3 (which scores high in this aspect as a barrier); it should be duly noted, however, that these correlations are far from establishing any causal claims (that higher competence will lead to less perceived importance of this barrier). It can be inferred from the above that the designer should avoid stressing on competences that are independent from the barrier that he might want to influence. It should be noted that regression models were not useful in detailing this information (no model showed a good fit).

## Conclusions

The advanced analysis of the H2M survey confirmed our initial assumptions that our main target audience is not homogenous and that it can be grouped into unique clusters. We concluded on six main clusters that were classified based on the respondents overall competence, commercial awareness, institutional environment and interest in training and show significant variations in their attitudes and “behavior”. The clustering exercise facilitated the targeting process; three of the six segments were selected for targeting and further analysis providing the programme designers with significant insights as to the points of difference and parity among these groups.

The three selected target clusters (namely clusters 2,3 and 5) have in common the high interest in training (which measures perceived usefulness and willingness to participate in business/entrepreneurship training). Overall, the three clusters seem to follow a novice/moderate/expert type of classification for most tested aspects, with cluster 3 being the one scoring relatively lower, cluster 5 being the expert and cluster 2 usually scoring within the middle range.

As could have been expected, previous experience in start-ups and previous training experience are two significant “classifiers” which seem to have a strong effect on most key aspects measured. Cluster 5 has a significantly larger concentration of respondents who have already started-up a company and of respondents that have already followed training in entrepreneurship/business. On the other side, Cluster 3 is mostly made of respondents with no previous experience.

Not far from this respect, experience in patent application, licensing out process initiation and prototype/product development follows the same pattern, with Cluster 5 respondents being the most likely to have experience in these areas. Although significant differences along the three clusters exist, it should be noted that cluster 2 has a remarkable performance whereas half of its respondents have already applied for a patent and more than half (55,3%) have already developed a prototype/product.

The analysis of the cluster differences in competences showed the same three-level pattern: overall cluster 3 scores low, cluster 5 high and cluster 2 in-between. Even though the differences along the 14 competences among the clusters are significant, the scores in some competences for clusters 2 and 5 converge, suggesting the possibility of common training approach in these areas. Most of these convergences appear in the less mainstream

competences (competences that do not belong in the main factor of competences) further suggesting that these areas are rather discrete.

**REMARK 1:** It should be noted that the self-reported assessments of competence are not paramount in documenting an absolute conclusion on whether real and objective differences in competence exist (even intra-cluster); both the fact that a Likert scale does not offer a precise assessment of actual knowledge (e.g. what practical information for the programme designer does it convey about actual knowledge and gaps for example in business planning if a respondent self reported the score 3 in comparison to one who self reported 4?) and the fact that these competence areas are very broad by default (e.g. how to take business decisions?) suggest that we should be cautious in how to interpret and to what extent we should use these metrics beyond that of meaningful broad indications. There is indeed a clear pattern of differences in the reported self-assessments but more clarifications before these are translated to specific training needs can be helpful.

The table below summarizes the rest of the results on the cluster differences and commonalities along the other categories.

	Cluster 2	Cluster 3	Cluster 5
<ul style="list-style-type: none"> <li>• Gender, research experience, country of work</li> </ul>	No significant differences		
<ul style="list-style-type: none"> <li>• Type of Organization</li> </ul>	Public	Public	Private
<ul style="list-style-type: none"> <li>• Affiliation</li> </ul>	Mixed	Academic	SMEs
<ul style="list-style-type: none"> <li>• EU project experience</li> </ul>	Experienced	<2 years	Experienced
<ul style="list-style-type: none"> <li>• Training mode preference</li> </ul>	No significant differences		
<ul style="list-style-type: none"> <li>• Willingness to travel</li> </ul>	More Flexible	Less flexible	More Flexible
<ul style="list-style-type: none"> <li>• Willingness to devote time</li> </ul>	Most willing	Less willing	Willing
<ul style="list-style-type: none"> <li>• Perceived Usefulness of training</li> </ul>	High	Relatively lower	Comparable to Cluster 2
<ul style="list-style-type: none"> <li>• Perceptions about the aim of research results: Publications</li> </ul>	No significant differences		
<ul style="list-style-type: none"> <li>• Perceptions about the aim of research results: Commercialization</li> </ul>	High	Average	Highest
<ul style="list-style-type: none"> <li>• Perceptions about the aim of research results: Providing solutions to health issues</li> </ul>	No significant differences		
<ul style="list-style-type: none"> <li>• Barriers/Obstacles</li> </ul>	Lack of Institutional Support	Lack of Interest Lack of necessary skills/knowledge	Lower scores on perceived barriers

**REMARK 2:** The main challenge for the programme designers lies in consolidating these rather deep differences under the training programme. On the one hand, the mixing of different cluster respondents under the same training scheme might have some advantages (e.g. teams that mix different clusters and characteristics might enjoy dynamic effects in learning). On the other hand, all these identified differences might suggest that a different approach for each segment is preferred. As there is no definite conclusion to be drawn from this survey, it is highly recommended that more research is done towards this challenge.

On top of the cluster analysis, the report focused on the further analysis of competences. The 14 preset competence areas are aspects that the H2M training can influence (increase) directly; the programme designers should be aware of which of these areas are more influential / beneficial.

The results suggest that most of the competence areas are positively correlated with the four key aspects (Commercial Readiness, Institutional Support, Start-up Readiness and Interest in Training). A number of competences were found to have an effect on these key aspects (namely Commercial Awareness and Start-up Readiness), suggesting that these competences might act as levers to increase these two aspects.

Finally, the analysis aimed to connect competences to specific entrepreneurship barriers/obstacles. The first part of this exercise focused on identifying which barriers are more important within the context of the H2M training; a number of the barriers/obstacles were found to be significantly linked to different key aspects. For example “Lack of the necessary knowledge” was correlated to “Commercial Awareness” and “Start-up Readiness”. The 14 areas of competence were then tested for correlation with the barriers and the mapping of the correlations shows which competences are (stronger) linked to certain barriers and which are not. The regression models were not able to provide any in-depth construct and more information is needed before any conclusion on possible effects of competences on barriers can be made.

## Annex

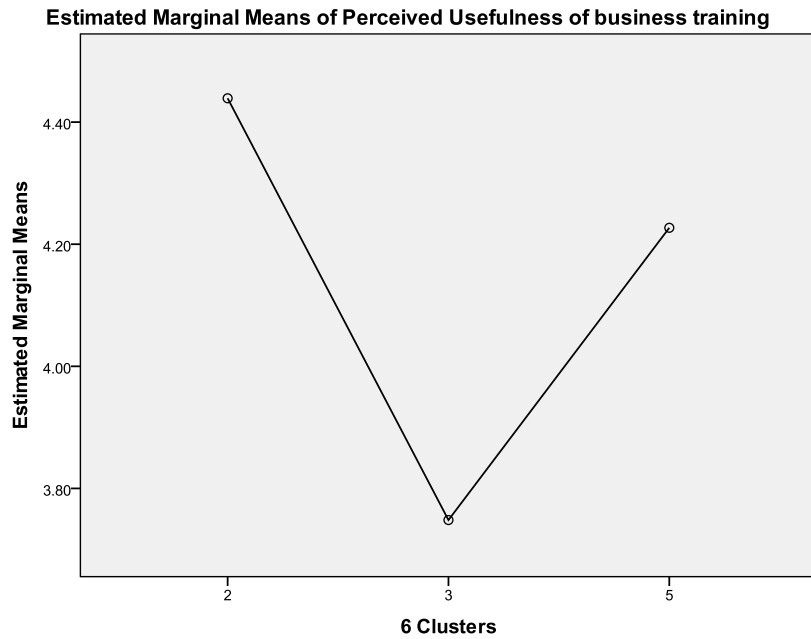
### *Analysis of Clusters and respondent's affiliation*

**Crosstab**

			6 Clusters			Total
			2	3	5	
15c. What is your main affiliation?	Academic Institution	Count	70	87	48	205
		% within 15c. What is your main affiliation?	34.1%	42.4%	23.4%	100.0%
		% within 6 Clusters	56.9%	62.6%	40.3%	53.8%
	Research Center	Count	23	33	24	80
		% within 15c. What is your main affiliation?	28.8%	41.3%	30.0%	100.0%
		% within 6 Clusters	18.7%	23.7%	20.2%	21.0%
	SME	Count	16	6	36	58
		% within 15c. What is your main affiliation?	27.6%	10.3%	62.1%	100.0%
		% within 6 Clusters	13.0%	4.3%	30.3%	15.2%
	Large Pharmaceutical Company	Count	1	0	1	2
		% within 15c. What is your main affiliation?	50.0%	.0%	50.0%	100.0%
		% within 6 Clusters	.8%	.0%	.8%	.5%
	Other Large Private Organization	Count	4	1	4	9
		% within 15c. What is your main affiliation?	44.4%	11.1%	44.4%	100.0%
		% within 6 Clusters	3.3%	.7%	3.4%	2.4%
	Regulatory Agency	Count	2	5	0	7
		% within 15c. What is your main affiliation?	28.6%	71.4%	.0%	100.0%
		% within 6 Clusters	1.6%	3.6%	.0%	1.8%
	International Organization	Count	0	2	1	3
		% within 15c. What is your main affiliation?	.0%	66.7%	33.3%	100.0%
		% within 6 Clusters	.0%	1.4%	.8%	.8%
	Patient Organization	Count	2	1	1	4
		% within 15c. What is your main affiliation?	50.0%	25.0%	25.0%	100.0%

	% within 6 Clusters	1.6%	.7%	.8%	1.0%
Freelance	Count	2	1	1	4
	% within 15c. What is your main affiliation?	50.0%	25.0%	25.0%	100.0%
	% within 6 Clusters	1.6%	.7%	.8%	1.0%
Other	Count	3	3	3	9
	% within 15c. What is your main affiliation?	33.3%	33.3%	33.3%	100.0%
	% within 6 Clusters	2.4%	2.2%	2.5%	2.4%
Total	Count	123	139	119	381
	% within 15c. What is your main affiliation?	32.3%	36.5%	31.2%	100.0%
	% within 6 Clusters	100.0%	100.0%	100.0%	100.0%

*ANOVA results: Perceived Usefulness of Business training along the 3 clusters*



*Regression Results*

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.086	.131		8.284	.000
	Competence1	.032	.044	.038	.716	.474
	Competence2	.048	.053	.051	.896	.371
	Competence3	.167	.053	.199	3.179	.002
	Competence4	-.033	.050	-.038	-.664	.507
	Competence5	.228	.054	.244	4.218	.000
	Competence6	.025	.045	.030	.570	.569
	Competence7	-.049	.048	-.059	-1.040	.299
	Competence8	-.013	.038	-.017	-.353	.724
	Competence9	-.040	.039	-.052	-1.024	.306
	Competence10	-.011	.036	-.013	-.306	.760
	Competence11	.084	.043	.096	1.956	.051
	Competence12	.170	.052	.201	3.295	.001
	Competence13	-.004	.052	-.004	-.071	.943
	Competence14	.067	.038	.085	1.779	.076

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
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	Competence7	-.049	.048	-.059	-1.040	.299
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	Competence13	-.004	.052	-.004	-.071	.943
	Competence14	.067	.038	.085	1.779	.076

a. Dependent Variable: Personal Confidence (3 Item Scale)

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.081	.132		15.785	.000
	Competence1	.048	.043	.057	1.105	.270
	Competence2	.138	.050	.157	2.736	.006
	Competence3	.009	.051	.011	.176	.861
	Competence4	-.054	.048	-.062	-1.117	.264
	Competence5	.113	.049	.135	2.287	.023
	Competence6	-.051	.044	-.061	-1.154	.249
	Competence7	.098	.047	.120	2.104	.036
	Competence8	.095	.038	.121	2.526	.012
	Competence9	.061	.037	.079	1.644	.101
	Competence10	-.029	.035	-.033	-.844	.399
	Competence11	-.124	.041	-.140	-3.056	.002
	Competence12	.149	.051	.178	2.937	.003

Competence13	-.083	.048	-.104	-1.721	.086
Competence14	.129	.037	.159	3.454	.001

a. Dependent Variable: CommercialAwareness

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.631	.194		13.595	.000
	Competence1	.071	.064	.066	1.116	.265
	Competence2	.104	.074	.093	1.404	.161
	Competence3	.041	.075	.039	.545	.586
	Competence4	-.178	.070	-.162	-2.532	.012
	Competence5	.073	.072	.068	1.004	.316
	Competence6	.040	.064	.038	.622	.534
	Competence7	.028	.069	.027	.408	.683
	Competence8	-.055	.055	-.054	-.990	.323
	Competence9	-.027	.055	-.027	-.485	.628
	Competence10	.017	.051	.015	.338	.735
	Competence11	-.048	.059	-.043	-.811	.417
	Competence12	.136	.074	.128	1.835	.067
	Competence13	-.007	.070	-.006	-.093	.926
	Competence14	.081	.055	.078	1.470	.142

a. Dependent Variable: InterestinTraining

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.305	.124		10.533	.000
	Competence1	.011	.042	.015	.270	.788
	Competence2	.069	.050	.081	1.367	.172
	Competence3	.135	.050	.175	2.724	.007
	Competence4	-.112	.047	-.140	-2.375	.018
	Competence5	.240	.051	.280	4.699	.000
	Competence6	.029	.042	.038	.696	.486
	Competence7	-.013	.045	-.017	-.292	.770



Competence8	-0.002	.036	-0.003	-.058	.954
Competence9	-.013	.037	-.018	-.342	.733
Competence10	-.049	.034	-.063	-1.440	.150
Competence11	.040	.040	.050	.988	.324
Competence12	.192	.049	.246	3.926	.000
Competence13	-.038	.049	-.050	-.768	.443
Competence14	.069	.036	.096	1.942	.053

a. Dependent Variable: StartupReadiness

*Cross-tabulation of country of work and the three clusters*

**CountryofWork \* Six-Cluster Variable Crosstabulation**

Count		Six-Cluster Variable			Total
		2	3	5	
CountryofWork	Other	15	22	16	53
	Austria	3	2	2	7
	Belgium	1	3	4	8
	Cyprus	0	2	0	2
	Czech Republic	0	1	1	2
	Denmark	2	2	1	5
	Estonia	1	2	1	4
	Finland	2	2	0	4
	France	7	9	10	26
	Germany	6	3	14	23
	Greece	7	6	2	15
	Hungary	2	0	1	3
	Ireland	2	2	3	7
	Italy	39	43	25	107
	Lithuania	1	3	0	4
	Netherlands	1	7	4	12
	Poland	1	1	1	3
	Portugal	3	1	0	4
	Romania	3	0	4	7
	Slovenia	1	1	1	3
	Spain	16	10	11	37
	Sweden	1	4	3	8

	United Kingdom	9	9	10	28
	Switzerland	0	2	3	5
	European Union	0	2	0	2
	Norway	0	0	2	2
Total		123	139	119	381