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1. **METHODOLOGICAL PREMISE**

a) **LIST OF ICT COMPETENCES MEASURED BY THE QUESTIONNAIRES – as returned for analysis**

1. Main characteristics of the digital community (web2.0 and new learning paradigms)
2. Factors ensuring effective online teaching in the context of school education and professional training.
3. Basics on Course Management System (CMS), Learning Management System (LMS), Virtual Learning Environment (VLE).
4. Technologies for preparing electronic contents: learning scenario, technical scenario, scenario implementation
5. Web-based environment for e-learning and related teaching models
6. Didactical digital materials and Learning Objects in Scorm standards
7. Web2.0 tools to share didactic materials (ex. slideshare, teachertube, etc)
8. Internet, web2.0 technologies and tools (google, youtube, wikipedia, fb, linked-in, vimeo, etc)
9. Tools for digital and social communication: messenger, skype, forums, wiki blogging, podcasting, collaborating, social networking, multimedia sharing, social tagging etc.
10. Search, modify, re-use digital didactic resources available on the net for rapid learning
11. Manage and moderate a community/group of e-learners
12. Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools.
13. Methods and software to develop multimedial didactic material for online trainings
14. Delivery and monitoring of e-trainings
15. Effective communication and cooperation in a Web 2.0 environment.

b) STATISTICAL METHODOLOGY

The present analysis is based on three separate raw datasets, one for each of the following countries: Germany, Poland, Italy.

The datasets are derived from online filled questionnaires by respondents from each of the three countries.

The number of respondents (records / rows) were:

- Germany: n = 21
- Poland: n = 48
- Italy: n = 20

The identities of respondents are available on the Excel files attached.

For each respondent (row), there were 45 responses (columns), corresponding to the number of competences on which respondents were asked to answer, multiplied by 3 hierarchical levels (strategic, tactic, operational) per competence. The number of raw variables (columns) were thus 45.

The above described datasets have been used for further analyses aimed to respond to the questionnaire objectives, namely, those described below (parts 2. and 3.). For part 2. (geographic context of survey's results), additional variables were calculated as the result of aggregation of all levels (strategic, tactic, operational), for each country. For part 3., (organizational context of survey's results), additional variables were calculated as the result of aggregation of all countries for each level (strategic, tactic, operational).

Statistical analyses were based on basic principles of descriptive statistics, namely calculation of absolute and relative frequencies for each level of competence on the taxonomy proposed (knowledge, comprehension, application, analysis, synthesis and evaluation, respectively, from the lowest to the highest), as well as sum of frequencies of responses of higher versus lower levels. Histograms reflect relative frequencies (%). Missing values were absent from raw data. Mode values are given when significant to the interpretation of results on a particular competence.

Data collected from questionnaires are typically analyzed through "descriptive statistics", i.e. number of respondents, frequencies (i.e., for each item, how many respondents indicated each possible answer), and mode (i.e., for each item, the most frequent answer, namely the one indicated by the greatest number of respondents). In the case of the ICT Competences report, the results and implications of the analysis were mainly based on the mode, since the responses were distinct qualitative categories (e.g. Evaluation, Analysis etc.) and not numerical values, and thus other indicators of central tendency (such as mean and median) would not be much significant.

The following report is based on the raw and refined data contained in the Excel file attached, so that it is possible to track the source of the conclusions drawn. Interpretation of such data is to some extent subjective given the level of abstractedness of raw data in comparison with the practical implications to be drawn according to the report directions

given. Subjectivity in interpretation of the questionnaire by respondents is by no means a responsibility of the person conducting analyses on data. Moreover, the person conducting analyses disclaims himself from any responsibility whatsoever in the case the raw data received are incorrect.

2. GEOGRAPHIC CONTEXT OF SURVEY'S RESULTS (3.1)

GERMANY

General outlook

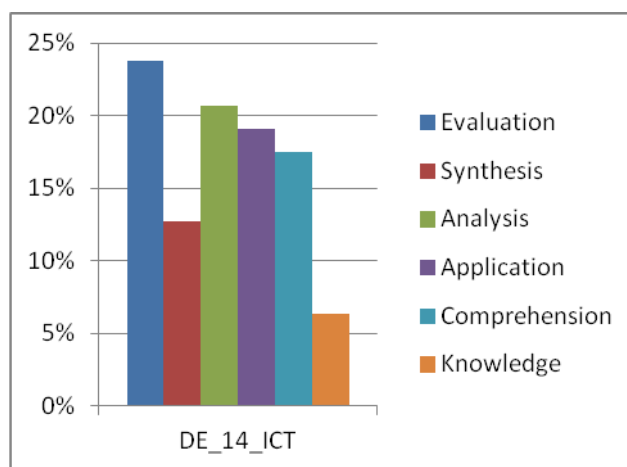
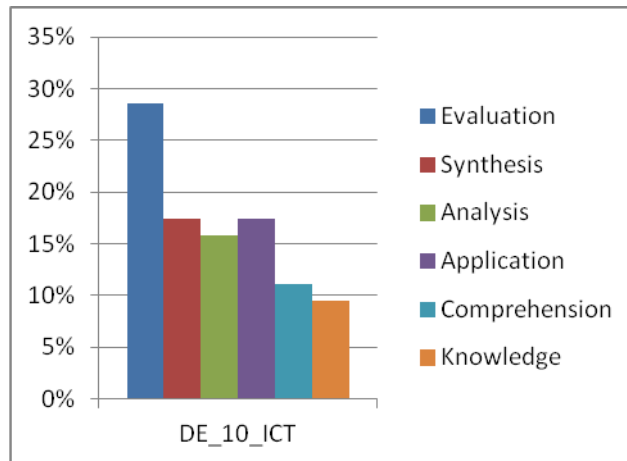
German respondents show a prevalence of responses where application is the most frequent answer: in particular, it is so in 9 out of 15 questions/competences.

Overall, the histograms are quite balanced as to the distribution of frequencies for each level of the taxonomy, and of the tendencies towards higher levels (analysis, synthesis and evaluation) versus lower levels (application, comprehension and knowledge). For example, it is possible to notice that with the exception of competence ICT_1 (showing most frequent responses on the knowledge and analysis levels) and other competencies that will be discussed below and show a good frequency on high levels (particularly evaluation and analysis), the cumulative frequencies are centred around the average level of application and the surrounding levels of analysis and comprehension. This is confirmed by the fact that in 8 out of 15 cases (competences), the cumulative frequency of the lowest three levels (knowledge, comprehension, and application) are higher than the cumulative frequency of the highest three levels (analysis, synthesis, and evaluation); in 7 out of 15 cases we have the opposite situation, where the cumulative frequency of the highest three levels is higher than the cumulative frequency of the lowest three levels.

Most requested competences

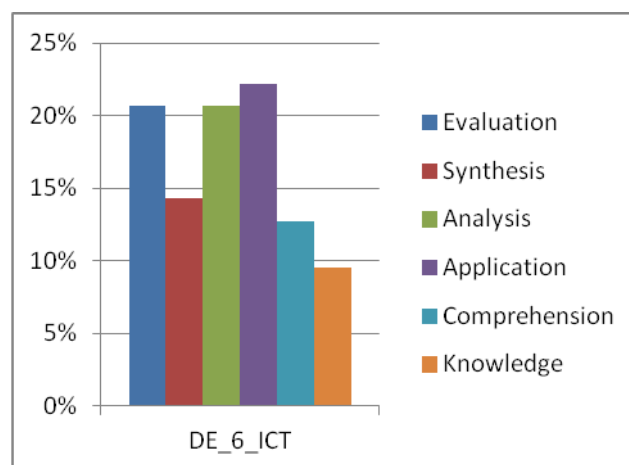
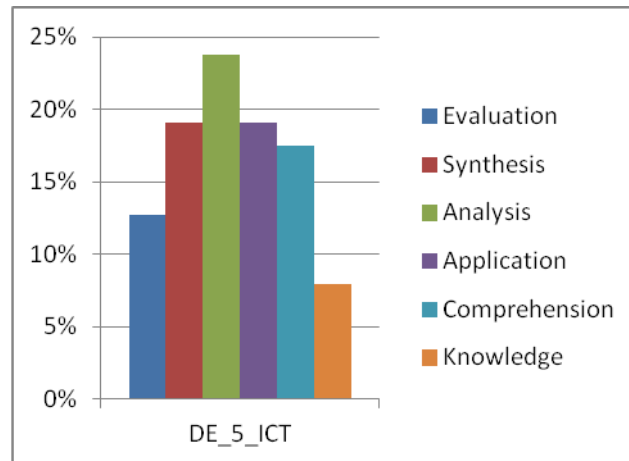
The competences that German respondents require the most regard:

DE_2_ICT	Factors ensuring effective online teaching in the context of school education and professional training.
DE_4_ICT	Technologies for preparing electronic contents: learning scenario, technical scenario, scenario implementation
DE_5_ICT	Web-based environment for e-learning and related teaching models
DE_6_ICT	Didactical digital materials and Learning Objects in Scorm standards
DE_10_ICT	Search, modify, re-use digital didactic resources available on the net for rapid learning
DE_14_ICT	Delivery and monitoring of e-trainings



The competences where a more advanced level of knowledge is required – according to the taxonomy on which the questionnaires were based – are, in particular, ICT_10 “Search, modify, re-use digital didactic resources available on the net for rapid learning”, and ICT_14 “Delivery and monitoring of e-trainings”. On the first question, almost 30% of responses were directed towards the need to possess the skills at the most advanced level, evaluation, while the second most frequent response was synthesis (together with application), and analysis got 16% of the responses. For competence ICT_14, regarding the delivery and monitoring of e-trainings, 24% of the responses again were directed towards the need to possess the skills at the evaluation level, while synthesis and analysis got 34% altogether (and thus the first three levels of the taxonomy were well above 50% of all responses).

Also, for competence ICT_5 “Web-based environment for e-learning and related teaching models” and ICT_6 “Didactical digital materials and Learning Objects in Scorm standards”, 56% of the responses were within the first three levels of the taxonomy (evaluation, synthesis, analysis), indicating that these are two competences that German respondents request to be taught at a fairly high level.



POLAND

General outlook

The most frequent response by Polish respondents across all questions (competencies) is application (the only exception is ICT_12 “Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools”, where they express the need to have a competence at an evaluation level).

Polish respondents exhibit on average a preference for lower levels of the taxonomy: in 10 out of 15 questions (competences), the average mean of relative frequencies on the lowest three levels (knowledge, comprehension, and application) is higher than the average mean of relative frequencies on the highest three levels (analysis, synthesis, and evaluation). The exceptions are competencies ICT_1, ICT_2, ICT_10, ICT_11, and ICT_12, which will be discussed below.

This indicates that respondents in this country think that the ICT competencies for logistics employees are to be taught at an intermediate level of the taxonomy, a level at which they can apply and understand knowledge and not necessarily be able to analyse, synthesize and

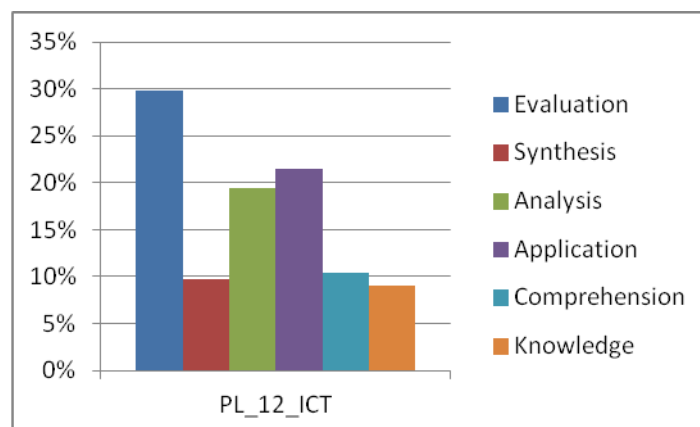
evaluate the principles of each of the 15 competences listed, with the above mentioned exception.

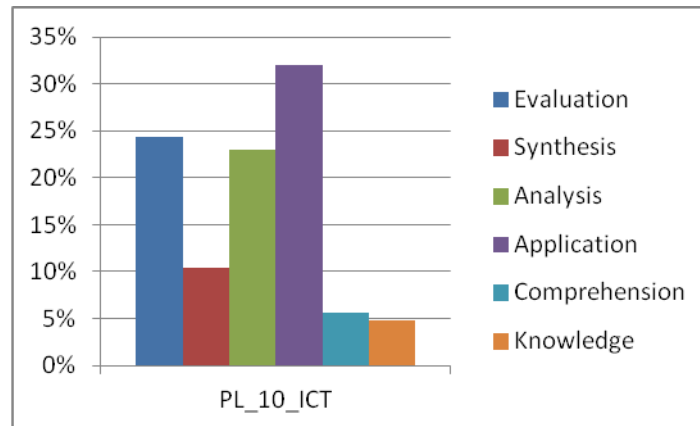
Most requested competences

The competences that Polish respondents require the most regard:

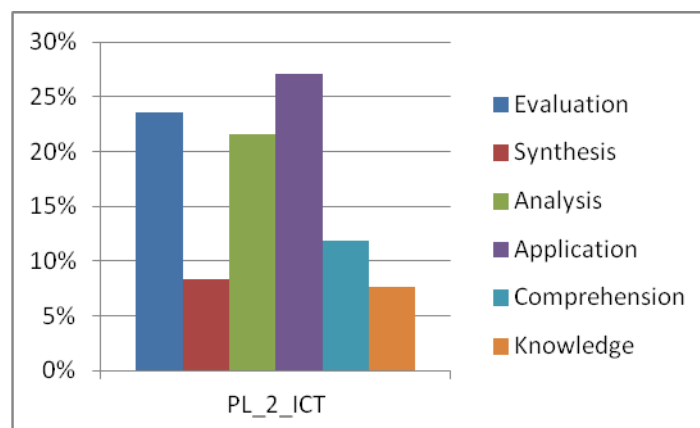
PL_1_ICT	Main characteristics of the digital community (web2.0 and new learning paradigms)
PL_2_ICT	Factors ensuring effective online teaching in the context of school education and professional training.
PL_10_ICT	Search, modify, re-use digital didactic resources available on the net for rapid learning
PL_11_ICT	Manage and moderate a community/group of e-learners
PL_12_ICT	Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools.

In particular, competence ICT_12 “Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools” shows a cumulative frequency of 59% of responses in the first three levels of the taxonomy (evaluation, synthesis, analysis). The need to possess this competence at the most advanced level, evaluation, is worth alone 30% of the responses. Besides, competence ICT_10 “Search, modify, re-use digital didactic resources available on the net for rapid learning” is also strongly requested, as the most frequent response is the evaluation level and the cumulative frequency of the evaluation, synthesis and analysis levels is 58%.





Competence ICT_2 “Factors ensuring effective online teaching in the context of school education and professional training” receives, like ICT_10 “Search, modify, re-use digital didactic resources available on the net for rapid learning” the evaluation level as the most frequent response. Competences ICT_2, ICT_1 “Main characteristics of the digital community (web2.0 and new learning paradigms)” and ICT_11 “Manage and moderate a community/group of e-learners” exhibit a cumulative frequency of the evaluation, synthesis and analysis levels slightly above 50%.



ITALY

General outlook

As for Germany and Poland, the most frequent response by Italian respondents across all questions (competencies) is application, with the exceptions of ICT_6 “Didactical digital materials and Learning Objects in Scorm standards”, ICT_10 “Search, modify, re-use digital didactic resources available on the net for rapid learning” and ICT_15 “Effective communication and cooperation in a Web 2.0 environment”, where they express the need to have a competence at a knowledge, analysis and evaluation level respectively.

However, differently from Germany, Italian respondents tend to indicate that competences are to be taught at the “low” levels of the taxonomy. The histograms show a general preference for the responses knowledge, comprehension, and application for most of the questions/competences. In fact, in 10 out of 15 questions/competences, the cumulative frequencies for the lower levels of the taxonomy (knowledge, comprehension, and

application) are higher than the cumulative frequencies for the higher levels (analysis, synthesis, and evaluation).

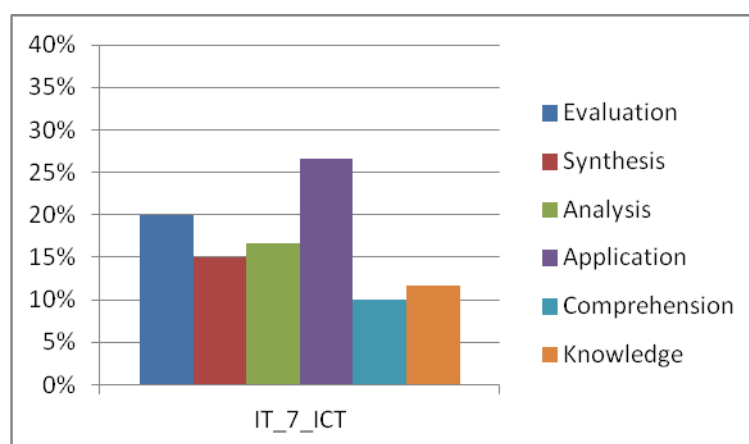
This indicates that the view of Italian respondents on the competences required in the field of logistics are of a more “practical” level, where employees need to apply – and sometimes simply know and comprehend – the basic elements for each competence. The competences for which the respondents tend to require a higher level on the taxonomy are discussed below.

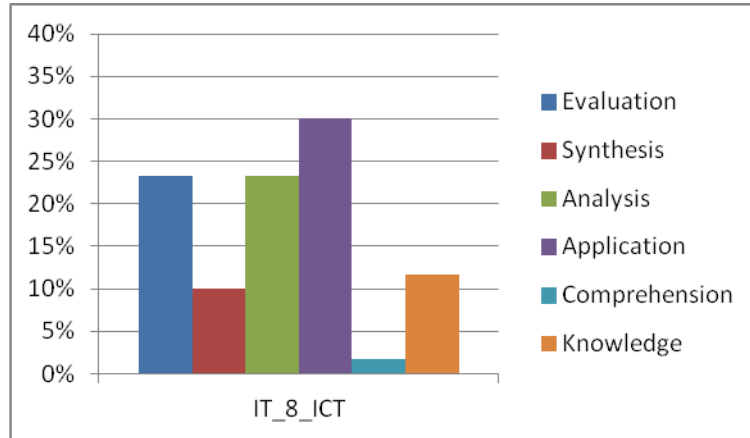
Most requested competences

The competences that Italian respondents require the most regard:

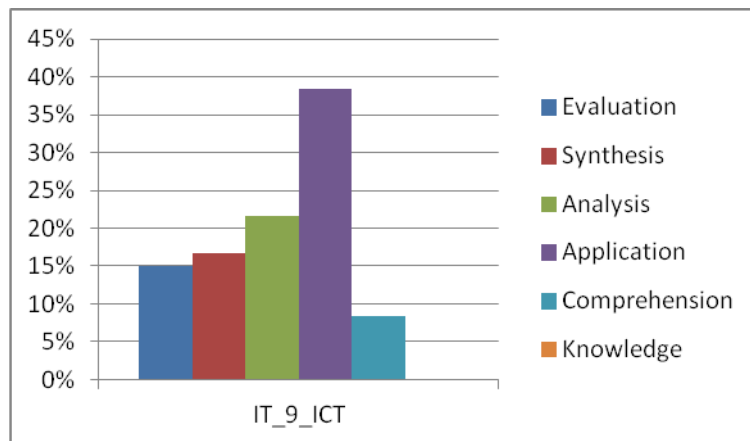
IT_7_ICT	Web2.0 tools to share didactic materials (ex. slideshare, teachertube, etc)
IT_8_ICT	Internet, web2.0 technologies and tools (google, youtube, wikipedia, fb, linked-in, vimeo, etc)
IT_9_ICT	Tools for digital and social communication: messenger, skype, forums, wiki blogging, podcasting, collaborating, social networking, multimedia sharing, social tagging etc.
IT_15_ICT	Effective communication and cooperation in a Web 2.0 environment.

In particular, respondents think that competence ICT_7 “Web2.0 tools to share didactic materials (ex. slideshare, teachertube, etc)” is required to be taught at an advanced level (evaluation, synthesis and analysis cumulatively get 52% of the responses); the same first three levels of the taxonomy get 57% of the total responses for the competence ICT_8 “Internet, web2.0 technologies and tools (google, youtube, wikipedia, fb, linked-in, vimeo, etc)”, although for both cases the most frequent response is application.

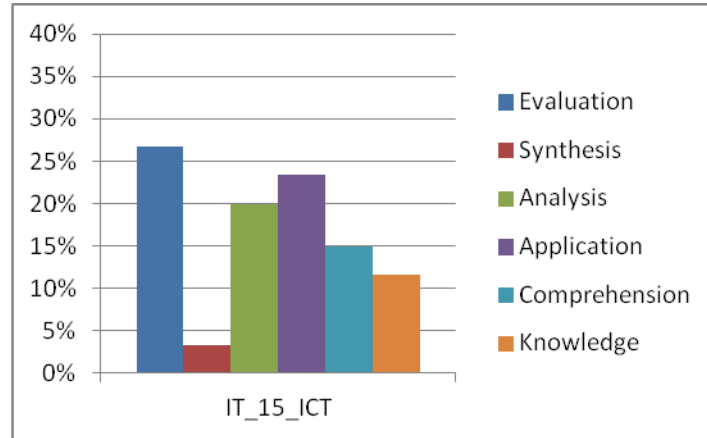




Competence ICT_9 “Tools for digital and social communication: messenger, skype, forums, wiki blogging, podcasting, collaborating, social networking, multimedia sharing, social tagging etc.”, too, receives a cumulative frequency of the first three levels of the taxonomy which is above 50% (53%). This competence is somewhat similar to the ICT_8 one, indicating that Italian respondents think that the social networking tools are of much importance among ICT competences for the logistics employees.



It can also be noticed how for competence ICT_15 “Effective communication and cooperation in a Web 2.0 environment”, the evaluation level is the most frequent response, getting 27% of the total responses (the first three levels on the taxonomy are worth 50% of the responses).



3. CONTEXT OF ORGANIZATIONAL LEVELS OF SURVEY

General outlook

The analysis of frequencies of all variables, at a disaggregated level with respect to employee levels and aggregated at the country level, confirms that the reasonable expectation that the highest the employee level (1. Strategic, 2. Tactic, and 3. Operational), the highest the level on the taxonomy at which the competences should be possessed according to respondents (evaluation, synthesis, analysis, application, comprehension, knowledge, in descending order).

For example, the most frequent answer at the strategic level is evaluation for the following competencies:

- Main characteristics of the digital community (web2.0 and new learning paradigms)
- Factors ensuring effective online teaching in the context of school education and professional training.
- Technologies for preparing electronic contents: learning scenario, technical scenario, scenario implementation
- Web-based environment for e-learning and related teaching models
- Search, modify, re-use digital didactic resources available on the net for rapid learning
- Manage and moderate a community/group of e-learners
- Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools.
- Delivery and monitoring of e-trainings
- Effective communication and cooperation in a Web 2.0 environment.

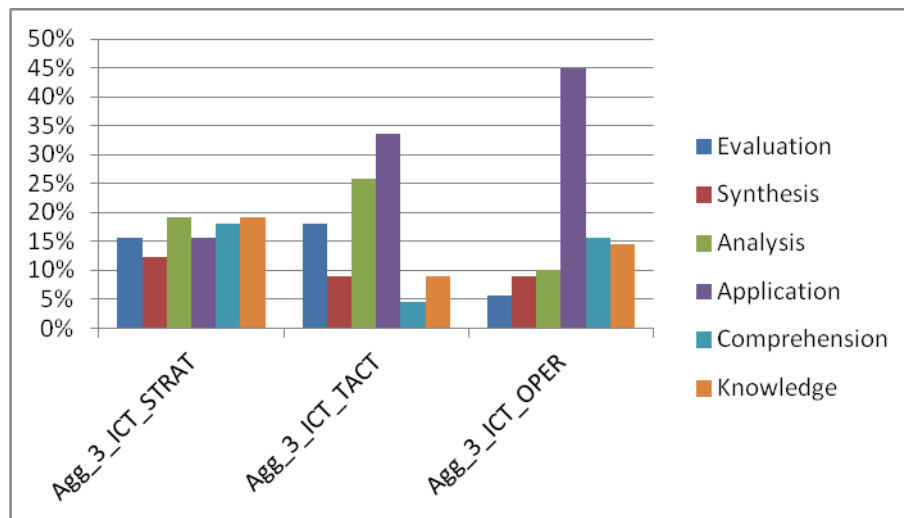
The distribution of frequencies is then “skewed” towards highest levels of required competence on the taxonomy for the strategic levels.

Mirroring this result, the distribution is skewed towards medium and low levels of required competence on the taxonomy for the tactic and operational levels, respectively. A strong result in this sense is suggested by the application level of the taxonomy being the most frequent response on **all of the questions/competencies at the operational level.** Possessing skills regarding the application of knowledge is then, according to respondents to the survey, a clear requirement for logistics employees at an operational level.

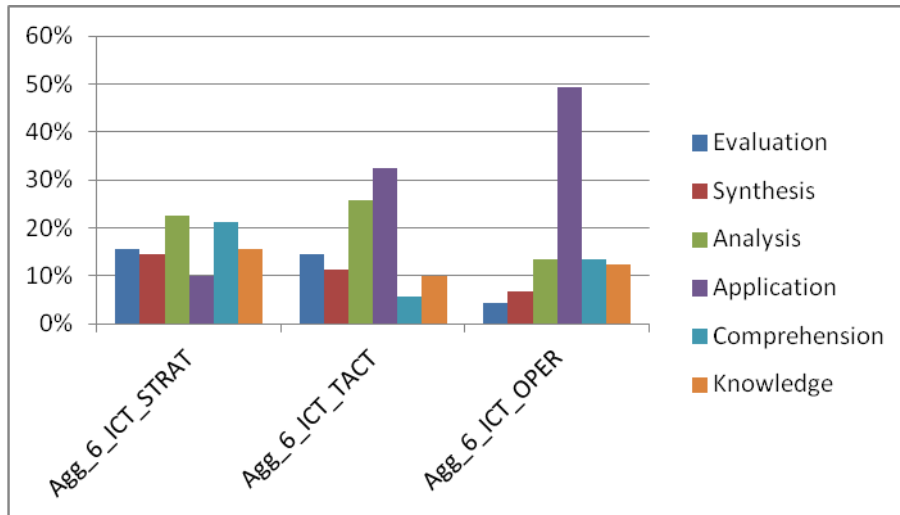
Application is also the most frequent response given to questions regarding competences required at the tactic level, with the exception of a few competences for which respondents, overall, indicate analysis as the required level on the taxonomy. The distribution of frequencies is then balanced among the three employee levels (strategic, tactic and operational) and the level of knowledge required reflects their relative ordering, with few exceptions in terms of particular competencies.

Fine-grained analysis on specific competences

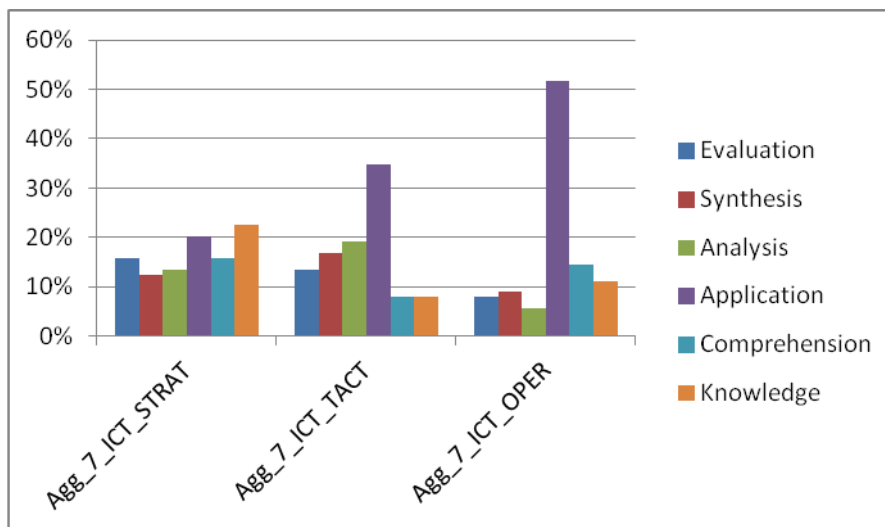
Respondents, as anticipated, think that employees at a strategic level should possess the highest level of competence (evaluation) on most of the competencies. The exceptions are represented by competence ICT_3 “Basics on Course Management System (CMS), Learning Management System (LMS), Virtual Learning Environment (VLE)”, ICT_6 “Didactical digital materials and Learning Objects in Scorm standards”, ICT_7 “Web2.0 tools to share didactic materials (ex. slideshare, teachertube, etc)”, ICT_8 “Internet, web2.0 technologies and tools (google, youtube, wikipedia, fb, linked-in, vimeo, etc)”, ICT_9 “Tools for digital and social communication: messenger, skype, forums, wiki blogging, podcasting, collaborating, social networking, multimedia sharing, social tagging etc.” and ICT_13 “Methods and software to develop multimedial didactic material for online trainings”.



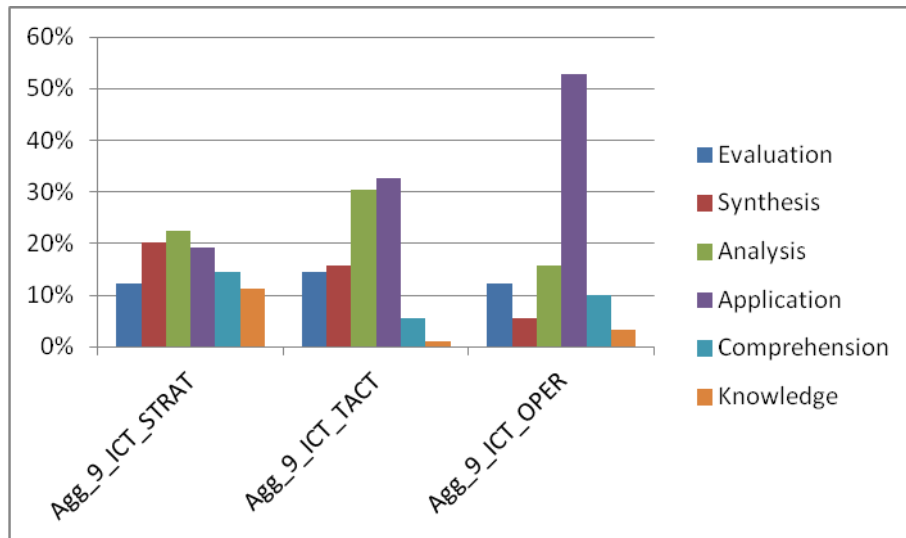
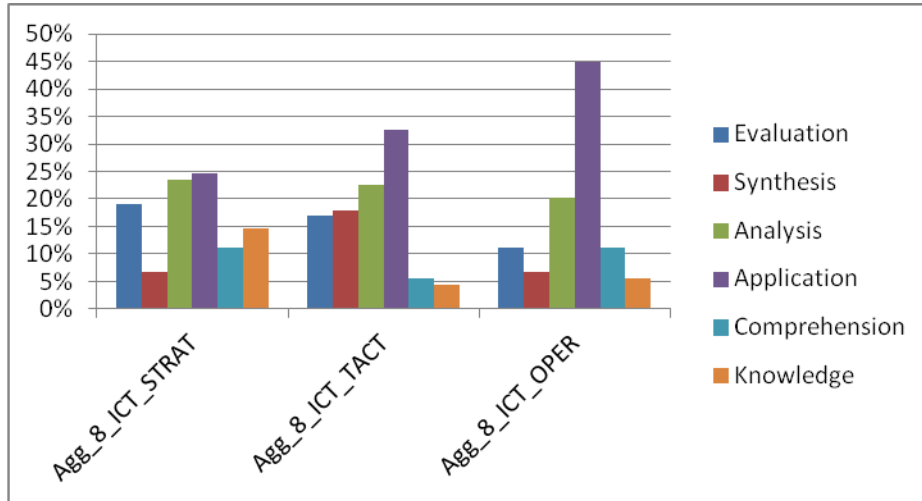
In the case of ICT_3, there is no clear indication of the level on the taxonomy at which employees at strategic level should possess this competence: aggregated frequencies for each level of the taxonomy show no response above the 20% level, with a slight preference for the analysis level.



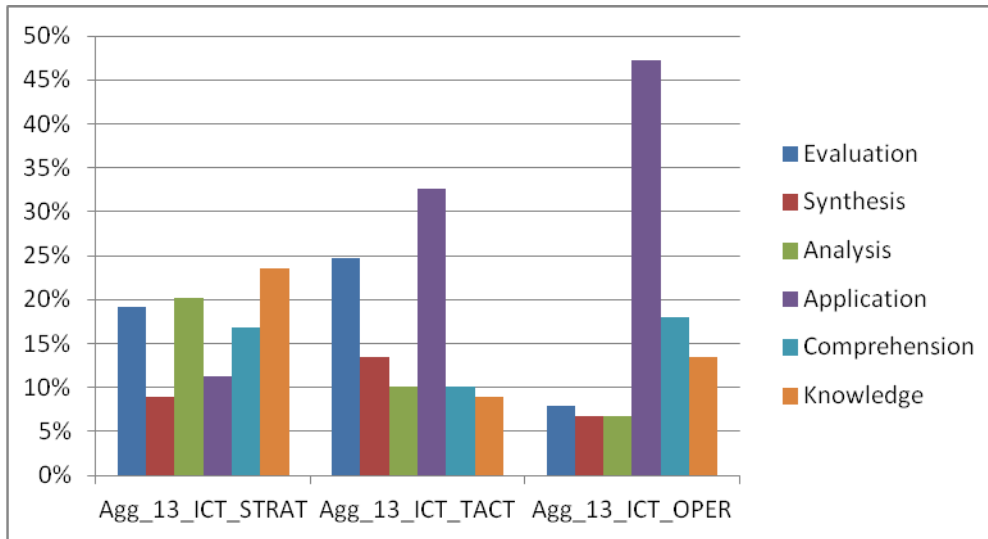
A similar pattern can be noticed for ICT_6: there is no clear convergence on a particular level of competence on the taxonomy at the strategic level, although analysis gets 22% of the responses, thus being the most frequent one.



ICT_7 shows a somewhat clearer pattern of responses, which are skewed, for the strategic level, towards the lowest levels of the taxonomy (the most frequent responses is the lowest level, knowledge). It seems that in the case of Web 2.0 tools to share didactic materials, strategic-level employees are not requested to possess particularly high levels of competences; on the contrary, a relatively superficial awareness of these tools is sufficient.



Middle-high levels of skill use on the taxonomy are predominant in ICT_8 and ICT_9 responses at both the strategic and tactic level, indicating that tools such as google, youtube, wikipedia, social networks, skype and so on are pervasive at the point of becoming important, according to respondents, for middle managers and top-level managers too. It has to be pointed out, however, that maybe because of the intuitive nature of these tools' usage, the possession of a evaluation or synthesis levels of competence on the same tools is not deemed to be fundamental at any level (strategic, tactic, or operational), even though for competence ICT_8 the evaluation response is the third most frequent on an aggregate basis.



In the case of ICT₁₃, there is again no clear convergence on a high versus low level of competence on the taxonomy at the strategic level. At the tactic and operational levels, instead, it is evident the opinion of respondents suggesting that employees should possess a mostly applicative level of knowledge. It has to be precised that, at the tactic level, respondents converge on the evaluation level of the taxonomy as the second most frequent answer given.

4. CONCLUSIONS

The following topics of particular lessons of e-learning modules are identified:

ICT COMPETENCES (Title of e-learning modules)	Country (Geographical Analysis)	Level
1. Main characteristics of the digital community (web2.0 and new learning paradigms)	Poland	Application
2. Factors ensuring effective online teaching in the context of school education and professional training.	Germany Poland	Application
3. Basics on Course Management System (CMS), Learning Management System (LMS), Virtual Learning Environment (VLE).		
4. Technologies for preparing electronic contents: learning scenario, technical scenario, scenario implementation	Germany	Evaluation
5. Web-based environment for e-learning and related teaching models	Germany	Analysis
6. Didactical digital materials and Learning Objects in Scorm standards	Germany	Application
7. Web2.0 tools to share didactic materials (ex. slideshare, teachertube, etc)	Italy	Application
8. Internet, web2.0 technologies and tools (google, youtube, wikipedia, fb, linked-in, vimeo, etc)	Italy	Application
9. Tools for digital and social communication: messenger, skype, forums, wiki blogging, podcasting, collaborating, social networking, multimedia sharing, social tagging etc.	Italy	Application
10. Search, modify, re-use digital didactic resources available on the net for rapid learning	Germany Poland	Evaluation Application
11. Manage and moderate a community/group of e-learners	Poland	Application
12. Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools.	Poland	Evaluation
13. Methods and software to develop multimedial didactic material for online trainings		
14. Delivery and monitoring of e-trainings	Germany	Evaluation
15. Effective communication and cooperation in a Web 2.0 environment.	Italy	Evaluation

ICT COMPETENCES	Topic tags	Level of organization		
		Operational	Tactic	Strategic
1. Main characteristics of the digital community (web2.0 and new learning paradigms)	Web 2.0 Poland	Application	Analysis Application	Evaluation
2. Factors ensuring effective online teaching in the context of school education and professional training.	online teaching Germany Poland	Application	Application	Evaluation
3. Basics on Course Management System (CMS), Learning Management System (LMS), Virtual Learning Environment (VLE).	CMS, LMS, VLE	Application	Application	Analysis Knowledge
4. Technologies for preparing electronic contents: learning scenario, technical scenario, scenario implementation	Scenario Germany	Application	Application	Evaluation
5. Web-based environment for e-learning and related teaching models	Web e-learning Germany	Application	Application	Evaluation
6. Didactical digital materials and Learning Objects in Scorm standards	Didactical digital materials; Learning Objects Germany	Application	Application	Analysis
7. Web2.0 tools to share didactic materials (ex. slideshare, teachertube, etc)	tools to share didactic materials Italy	Application	Application	Knowledge
8. Internet, web2.0 technologies and tools (google, youtube, wikipedia, fb, linked-in, vimeo, etc)	Internet, web2.0 technologies and tools Italy	Application	Application	Application
9. Tools for digital and social communication: messenger, skype, forums, wiki blogging, podcasting, collaborating, social networking, multimedia sharing, social tagging etc.	social networking, messenger, skype, forums, wiki blogging Italy	Application	Application	Analysis
10. Search, modify, re-use digital didactic resources available on the net for rapid learning	Search, modify, re-use digital didactic resources Germany Poland	Application	Analysis	Evaluation
11. Manage and moderate a community/group of e-learners	Community management Poland	Application	Application	Evaluation
12. Assessment of training needs and effective evaluation of acquired knowledge through e-learning platform tools.	Assessment of training needs; evaluation of acquired knowledge through e-learning Poland	Application	Application	Evaluation
13. Methods and software to develop multimedial didactic material for online trainings	multimedial didactic material for online trainings	Application	Application	Knowledge
14. Delivery and monitoring of e-trainings	. Delivery and monitoring of e-trainings Germany	Application	Application	Evaluation

<p>15. Effective communication and cooperation in a Web 2.0 environment.</p>	<p>communication and cooperation in a Web 2.0 environment Italy</p>	<p>Application</p>	<p>Analysis</p>	<p>Evaluation</p>
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