ECP 2007 EDU 417008

ASPECT

National Validation Reports: Belgium, Lithuania, Portugal, Romania

Deliverable number	D6.4
Dissemination level	Public
Delivery date	April 2011
Status	Final
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This project is funded under the *e*Content*plus* programme1, a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable.

1 OJ L 79, 24.3.2005, p. 1.



Summary

This deliverable is a compilation of the national validation reports produced by the ASPECT partners involved in the school pilots organized in Belgium (Flemish Community), Lithuania, Portugal and Romania. Each report covers the validation work carried out in each country from teacher selection to the evaluation of the content discovery and use solutions proposed by the project.



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1 Introduction

Deliverable D6.4 presents the main results from tests carried out with Belgian, Lithuanian, Portuguese and Romanian teachers. The ASPECT project held three workshops for teachers described in deliverable D6.2 "Protocol of National Experimentation". Initially, national workshops were held in the four countries participating in the ASPECT pilots (Belgium, Lithuania, Portugal and Romania) in the autumn of 2009; these mainly covered issues related to content discovery. The second workshop was carried out online in March 2010 and also covering content discovery as well as the functionalities of the ASPECT version of the Learning Resource Exchange portal. The third workshop was a joint summer school for all teachers in May 2010. The third workshop concentrated on assessing teacher responses to content access controls and content packaging.

The evaluation instruments in the workshops included direct observation, interviews and questionnaires. These instruments and activities are detailed in deliverable D6.5.



2 Portugal

2.1 Introduction

This report provides the data collected from experiments conducted with 10 Portuguese teachers of Science subjects who took part in three separate ASPECT School Pilot workshops. The report includes background information on the teachers selected for the experiments, data we gathered on teachers' search behaviours and satisfaction with the ASPECT LRE portal vs. Google, teachers' attitudes toward learning resource reuse and sharing of resources, and teachers' feedback on packaged content in SCORM and IMS Common Cartridge formats. The procedures, tasks, tests and questionnaires are described in detail in deliverable D-6.5. Workshop 1 with Portuguese teachers took place Lisbon, Sat 10 Oct 2009 eliciting teachers' feedback on search tools and collecting data on teachers' search behaviours. The second workshop was carried out online in March 2010 covering content discovery as well as the functionalities of the ASPECT LRE portal vs. Google. The third workshop was a joint project summer school for 45 teachers from all four countries in May 2010.

All materials were translated from English to Portuguese in preparation for work with Portuguese teachers.

2.2 Teachers and ICT

According to statistics for the school year 2008-2009, there were 34,361 Primary school teachers in total in Portugal. Figures for the second cycle of Basic Education teachers (5th and 6th years of compulsory schooling) were 34,069. For the third cycle of Basic Education (6th to 9th year students in compulsory schooling) and Secondary Education (10th to 12th years of schooling) the total number of teachers was 91,325.

Biology and Geology teachers totalled 6,935 in 2008-2009, with 6,224 in state-run schools. Physics and Chemistry figures are not very different with 7,161 in all, 6,434 teachers in the public sector. There are a total of 9,934 mathematic teachers (9,014 in state-run schools). About 43,000 of a total of approximately 150,000 teachers will have attended teacher training courses and workshops in ICT by the end of this school year, but it is expected that all Portuguese teachers will have developed ICT skills or have them certified, by 2015.

Figures for 2008-2009 show that overall there is a ratio of 2.1 students per computer in Portuguese schools, with the following distribution in the public sector: 1.1 in primary schools, 3.8 in 2nd cycle schools, 3.9 in 3rd cycle schools and 4.1 in secondary schools.

Internet access shows the following figures: 2.3 for the average ratio in public schools, with 1.1 in primary schools, 5.2 in 2nd cycle schools, 5.1 and 5.0 in 3rd cycle and secondary schools.

All non-primary schools are equipped with computers, interactive whiteboards and video projectors. Primary schools are equipped with computers but interactive whiteboards are not yet as ubiquitous. In the framework of the so-called Magellan initiative (from the name given to small laptops directed specifically to primary school children), children can buy one of these computers for $50\in$, in most cases, and for as low as $20\in$ or for free if their families cannot afford to pay for them.



The average number of students per class, irrespective of subject, is between 26 and 28. Classes are split into two groups when they attend laboratory classes. This applies mainly to Secondary school students.

Mathematics has its own "Action Plan for Mathematics", an initiative of the Ministry of Education to support the development of school projects which aims to improve students' learning and their school results. There are about 1,070 2nd and 3rd cycle schools that have accepted this challenge.

Science is taught separately from the 2nd cycle of Basic Education upwards. It is subdivided into Natural Science and Mathematics in the 2nd cycle; Biology, Physics and Chemistry and Mathematics in the 3rd cycle; and Biology and Geology, Physics, Chemistry and Mathematics in Secondary education.

The current model of in-service teacher training in the educational use of ICT is a three-layer system: (a) digital skills: this layer basically covers ICT literacy skills and corresponds to those in the European Computer Driving Licence; (b) pedagogical skills: at this level teachers are educated in specific uses of ICT in their teaching subjects and relevant tools, such as interactive whiteboards; (c) teacher training skills: aimed at those teachers who educate other teachers in the educational use of ICT in schools.

Courses at each level are 15-hours long and they are usually delivered in 3-hour sessions, both face-to-face and via e-learning (blended learning).

If teachers have attended previous courses corresponding to the digital skills layer, they can request the corresponding certificate. For the other two layers, all teachers are required to attend training courses as part of their professional development scheme.

All public school teachers have access to this kind of training through local School Association Teacher Training Centres.

At the time of writing this deliverable, emphasis has been put on training as many teachers as possible in the use of Interactive White Boards (IWBs), as all non-primary schools have been equipped with them.

2.3 ASPECT Teachers

The selection of the Portuguese teachers was done according to the following criteria:

- Being primary schools teachers, Science (Biology, Physics and Chemistry) and Mathematics teachers, teaching 12-15 year-old students.
- Having basic knowledge of English (writing, listening and reading skills).
- Being able to be part of the various pilots, including face-to-face work and distance interactions.
- Having some previous experience in the use (and, whenever possible, the creation) of digital learning resources.
- Showing interest in learning and sharing experiences on standards and specifications for educational content.
- A significant number of the teachers had already worked with the DGIDC in other European projects, such as eTwinning, while some were contacted as a result of the ICT work they had been doing in their respective schools.



Five female and five male science teachers matching the above criteria were selected to take part in the ASPECT project testing.

Nine of the ten teachers selected for the ASPECT experiments were experienced teachers (teaching for 10 years or more). They reported regularly using computers and web-based materials in lesson preparation and in the classroom as seen in Figures 1 and 2.



How often do you prepare teaching materials using ...?

Figure 1: Materials used when preparing lessons.

How often do you use with your students...?



Figure 2: Materials used with students.

The daily high percentages of IT tools used by Portuguese teachers are shown in figure 3.





How often do you (at home/or in the class room)?

Figure 3. Computer and Internet use within a classroom or at home.

Eighty percent of the teachers classified themselves as "very advanced" users of IT, regularly using Google and Wikipedia and MS Office, learning environment tools and social networking sites as seen in Figure 4.



Figure 4: IT knowledge of Portuguese teachers based on use of different tools like Skype, VLE, social networks, participation on forum and knowledge of html.

Teachers regularly use materials such as PowerPoint presentations, tasks and assignments, videos, pictures and texts in more than 80% of cases as illustrated in Figure 5.





What sort of materials you use?

Figure 5: Type of materials teachers use in the lectures.

In most of the cases teachers make new materials and edited materials found online for classroom use as we can see in figure 6.



How much have you ...?

Figure 6: Use of Materials found online

We asked teachers to indicate what features of portals should be improved to support teachers more effectively in their daily tasks. More than 90% of the teachers wanted to see better search tools followed by issues such as interfaces available in Portuguese, ease of use and reliability as seen in Figure 7.





What sort of functionalities would be helpful...?

Figure 7: Portal functionalities relevant for the teachers.

As we can see in figures 8 and 9 that, in most of the cases, teachers are willing to co-operate with other teachers regardless of whether they are from the same school or from different schools, or even from another country.



Have you ever co-operated when creating web resources

Figure 8: Collaboration amongst teachers when creating web resources.



Sharing web materials with ...



Figure 9: Collaboration amongst teachers when sharing web materials.

In most of the cases, as we can see in figure 10, teachers think it would be difficult to share materials because curriculums are unlikely to be compatible and in less than 50% of the cases, for copyright issues.





Figure 10: Barriers of sharing materials produced in different countries.

Moreover, figure 11 shows that, while teachers experience some problems when trying to cooperate with teachers in other countries, no single problem represents a major hurdle.



What kind of problems do you think will appear in co-operation between teachers from different countries?



Figure 11: Barriers of collaboration among teachers.

2.4 Search Behaviours and User Satisfaction

Data on teachers' search behaviours was gathered using two questionnaires in the first workshop. We solicited teachers' opinions on usability issues when using the ASPECT LRE portal vs. Google and evaluated their processes when creating lesson plans for science subjects using different types of resources. Keywords were the most common method for searching in the ASPECT LRE for all types of learning resources. Although initially this group of teachers indicated that they were likely to trust resources recommended by friends or reviewed by colleagues, these preferences were not common in their search strategies as seen in figure 12.





Figure 12: Different ways of finding the resource.

Keywords were the most common method for searching reported by Portuguese teachers for all types of learning resources (images, simulations, interactive animations, activities/test animation).

To understand what teachers meant when they discussed the "quality" of content we elicited opinions on the most important criteria for quality. All Portuguese teachers agreed or strongly agreed that a mark of quality for a resource was its scientific accuracy. Large majorities also thought that quality meant a resource made good use of multimedia and had a clear impact on learners. For a majority of Portuguese teachers, as seen in Figure 13, quality was not synonymous with the reputation of the content provider.





Quality for me means...

Figure 13: Meaning of "quality" for teachers.

Ninety one percent of teachers reported relying on recommendations to determine if they should trust the resources they find. They also reported trusting resources that came from respected organizations.



Figure 14: Reasons teachers trust resources they find

Although 91% of teachers initially indicated that they were likely to trust resources reviewed by colleagues and scientists, these preferences were not their primary choices for conducting searches.





I find resources...



As we can see in figure 16, 73% of teachers using the ASPECT LRE found websites they would use in the future. They also liked the direct links to subjects, found resources in different languages and liked the advanced search functions. However, a very high percentage (73%) did not find that the rating system helped them to find good quality resources.



Did you...?

Figure 16: User satisfaction



2.5 Google vs. ASPECT LRE

We compared the time it took teachers to find the "same" resource using the ASPECT LRE vs. Google. Prior to this workshop we had identified 4 resources in the ASPECT LRE for each national group. We called them BE, RO, LT and PT (the origin of the names comes from the focus group teacher that originally found that resource). We provided the teachers with several characteristics of each resource and told them to find a resource using the ASPECT LRE portal and Google which best matched the given characteristics.

Portuguese teachers were asked to find the BE, RO and LT resources, but not the PT, as they had seen the PT resource in the example lesson plan that we provided.

Teachers were given instructions to alternate the order in which they used the ASPECT LRE or Google to look for the resources, as it would be reasonable to expect that the second time they looked for a resource (be it via Google or the LRE) would take them less time.

Before the start of the project, 30% of the teachers had some knowledge of the LRE portal but had never used it. In 80% of the cases they knew Google and had been using it. Regarding their national portal, only 20% had used it, another 20% knew about it, but the majority had no knowledge of it.

Once the teachers became familiar with the ASPECT LRE, a large percentage of teachers (73%) reported finding web pages they would use in the future (figure 16). They also liked the direct links to subjects, found resources in different languages and liked the advanced search functions.

Figure 17 represents the time Portuguese teachers took to find those resources using Google or the ASPECT LRE. On average, Portuguese teachers found the resources in less than 15 minutes, the time being quite similar whether using Google or the LRE. For the resource created by a Romanian teacher (RO resource), Portuguese teachers found it much quicker when using the LRE than with Google.



Figure 17: Bars represent time it took the Portuguese teachers to find the resources using Google or the LRE. [0,1] means up to 5 minutes, [1,2] means up to 10 minutes, [2,3] up to 15 minutes and [3,4] did not find the resource within the 15 minutes they had. Lines indicate average time it took the teachers to find the resource using the



different portals.

2.6 Building Lesson plans with packaged content: SCORM and IMS Common Cartridge formats

Teachers' reactions and use behaviour patterns with IMS Common Cartridge and SCORM were elicited during a workshop organised in May 2010 in Lisbon that brought all the teachers together. User testing focused on the integration of resources into Learning Management Systems (LMS) and content packaging, in particular exploring how different types of "content packaging" can add value to the learning experience. The LMS used was Moodle. Teachers who had not experience with Moodle were provided with a basic training session in its use.

The workshop was built around three main tests, each of them followed by two types of feedback methods involving questionnaires and open discussions. All three tests were designed to serve both as a basic training on the use of different types of packaged content and their features (necessary as the teachers had no previous experience with this kind of content) and, at the same time, provided an opportunity to obtain teachers' reactions and interest levels in adopting packaged content in their classrooms.

All teachers underwent a training session on the use of Moodle and the integration of packaged resources in the LMS. Once they were familiar with this platform, we asked them to create the same lesson plan four times: 1) normal lesson plan using the Moodle learning platform in a "traditional" way, i.e., by combining different resources; 2) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the SCORM standard; 3) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the IMS Common Cartridge standard; and, finally, 4) just embedding parts of the IMS Common Cartridge.

Eighty-two percent of Portuguese teachers participating in ASPECT had used Moodle to create a course on numerous occasions before the tests. This number was much larger than the average of 42% for all teachers participating in the testing process.

Portuguese teachers expressed different opinions when using SCORM and IMS Common Cartridge packages, and their implementation in Moodle. All ten of the Portuguese teachers indicated that they preferred using bits of materials they found on the web and mixing them with other materials over using an entire package (a course or a lesson).

Portuguese teachers found it slightly easier to create a lesson plan using a normal web page that using IMS Common Cartridge package (figure 18). Nevertheless, in almost half of the cases it was really easy for them to create a lesson plan using IMS Common Cartridge.





Figure 18: Difficulty creating a lesson plan.

Portuguese teachers found that it was easy to create a forum using a normal web page (figure 19) and more than 50% of teachers also found it easy to create a forum using a SCORM or IMS Common Cartridge package.



Figure 19: Difficulty creating a forum.



In the case of creating questionnaires, Portuguese teachers found that using an IMS Common Cartridge package was as easy as using a normal web page (figure 20) and that taking parts of an IMS Common Cartridge was easier than using a SCORM package.



Figure 20: Difficulty creating a questionnaire.

In all cases (creating a lesson plan, a forum or a questionnaire), teachers found that using SCORM, IMS Common Cartridge or parts of the latter, was not an impossible task for their everyday work.

As we can see in figure 21, Portuguese teachers would use each of the packaging formats in different contexts. SCORM appeared to be helpful for them if they were giving students homework assignments or teaching online. IMS Common Cartridge appeared most helpful to them when they wanted to selectively mix resources with other materials for creating teaching materials.





How big of a benefit do you see when...

Figure 21: Teacher preferences for using different formats

The response of teachers to using SCORM or IMS Common Cartridge content packages in Moodle was positive. Only 18% of teachers thought that using SCORM was not desirable in Moodle because it would be time consuming or difficult to edit its parts as seen in figure 22. Another 18% thought there would be some time lost initially to learn the features but would ultimately be worth the investment. When it came to teachers' appraisal of IMS Common Cartridge in Moodle, 45 % were concerned that, at first, it would take a significant amount of time to learn how to use it but that it would ultimately be worth the time investment. Another 45% thought it would save time because they could import the full package into Moodle and only 9% thought it would consume too much time to learn how to edit individual parts.



I think that using SCORM packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do
- I would loose time because I would still want to edit the parts and that would be really complicated

Figure 22: Use of SCORM with Moodle.

I think that using IMS CC packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do
- I would loose time because I would still want to edit the parts and that would be really complicated

Figure 23: Use of IMS Common Cartridge packages in Moodle.



More than half of the teachers prefer IMS Common Cartridge packages in Moodle if they are teaching an entire online course and when they give students online homework or extra credit work and 36% of them would use it just to show the materials to their students. Only in less than 30% of the cases teachers would they use a SCORM package in Moodle or a SCORM Player view for any of the above options (figure 24).



...you are giving them online homework/extra credit work?

Figure 24: Interface preferences for different features.

Figure 25 demonstrates that it is very important for teachers that the packages have the following features:

- they include an easy way of taking pieces of the package to be uploaded to a LMS
- teachers could control the tasks open for students by what tasks they have already completed
- they include high quality materials

In some cases teachers would also like that the packages include:

- simulations or other interactive flash content
- different view to the one the students see
- discussion forums
- questions/assessments (which would give feedback)
- web content and links



Overall, approximately 73% said that they need flexible materials, which they can adapt to their own teaching daily or weekly and about 55% said that they never need stable structured materials, which they cannot edit, but have to use as a complete package.



Figure 25: How important is the following content packaging issue for Portuguese teachers?

2.7 Access Control Mechanisms

The ASPECT LRE portal used during the last phase of testing supported three models for controlling the access to content: freely accessible content; licence-based access (i.e., the access to a collection of resources is granted to a group of users); and credit-based access (i.e., the access to some resources requires the use of some credit). Participating teachers were provided with some credits and asked to get resources available for free or for credit. After having been exposed to credit-based access, teachers were asked to think about the use of digital credits to buy or access digital online resources.

In 55% of the cases Portuguese schools buy resources online (figure 26). Teachers prefer not to purchase resources, irrespective of whether they are provided with credits. 36% expressed disinterest in any digital credit system, insisting that resources should be provided free of charge to teachers (figure 27).



Do you (or does your school) currently buy resources online?



Figure 26: Do teachers (or schools) buy resources online?

How do you feel about using credits in order to access resources that are not free?



Figure 27: Teachers' opinions about using credits in order to access to Digital Resources that are not free.

All Portuguese teachers created their own learning resources and said that they will continue to do so in future. Also, they said they did not mind sharing their own resources if they could get other teachers' resources in return or if they were paid extra to share resources (figure 28).







Figure 28: Teachers' motivations for creating resources.

In order for teachers to gain credits, we made two proposals. First, teachers could gain credits by rating other people's resources or providing feedback to them. Second, teachers could gain credits by uploading resources they had created. In both cases (figures 29 and 30) 55% of Portuguese teachers indicated they would use either approach to gain the credits. 36% considered both ideas interesting but said they would like to try them first to see what they involved.





I don't see any benefits in rating content (for example with stars) or giving feedback on them

Figure 29: How do Portuguese teachers feel about credit-based access to materials, if they could gain credits by rating other people's resources or providing feedback on them?



How do you feel about credit-based access to materials, if you could gain credits by uploading resources you had created to the platform?



- I would definitely use this approach to gain credits myself It would be the natural way: I give some, I get some.
- Interesting idea, but I would like to try to first to see what it involves
- I'm not sure if I would use this approach myself
- Sounds like too much work for me
- I wouldn't want to share my content with others

Figure 30: How do Portuguese teachers feel about credit-based access to materials, if they could gain credits by uploading resources they had created to the platform?

2.8 Conclusion

In Portugal, 10 teachers participated in the ASPECT project, all with many years of teaching experience. Most of the teachers in the project had advanced proficiency in the use of computers and most of them used a computer for more than 4 hours a day.

Portuguese teachers found the resources they were looking for more quickly when using the ASPECT LRE portal than when using Google. Portuguese teachers also preferred to mix different kinds of resources. Ultimately, teachers indicated a strong preference for flexible forms of content packaging with many possible features that allowed them to easily modify or fully edit learning resources, rather than having structured materials that could only be marginally manipulated.



3 Belgium

3.1 Introduction

This section presents the main results from tests carried out with the Belgian teachers from the ASPECT group of teachers in the course of three workshops.

Workshop 1 with Belgian teachers took place in Ghent on Saturday 3 October, 2009 eliciting teachers' feedback on search tools and collecting data on teachers' search behaviours. The second workshop was carried out online in March 2010 covering content discovery as well as the functionalities of the ASPECT LRE portal vs. Google. The third workshop was a joint summer school for 45 teachers from all four countries in May 2010.

Contrary to the teachers from the other countries, the Flemish teachers turned down the offer to have all materials translated into Dutch for the international workshop (aka summer school) that took place in Lisbon in May 2010. They felt confident they could carry out the activities in English without any problems. During the workshop no problem was noticed following this decision.

The following report is divided into sections describing:

- General information on the Belgian teachers that took part in the tests.
- Results on the discovery of resources and the data on the use of ASPECT LRE vs. Google.
- Feedback from Belgian teachers on SCORM and IMS Common Cartridge packages, and their implementation in Moodle.

3.2 Teachers and ICT

Beginning in 2002-2003, schools have been receiving resources for the coordination of their ICT policy. Education levels with higher needs get more funds which can be used to recruit an ICT coordinator. The key task of the regional network of experts REN Vlaanderen (www.renvlaanderen.be) is to give teachers an in-depth training in the educational use of ICT. REN Vlaanderen provides both supply and demand-driven inservice training.

Under the authority of the Flemish Ministry of Education and Training and together with KlasCement (www.klascement.net), an educational portal site providing various teaching materials was developed. It makes the results of government projects available to a wider range of educational stakeholders. At regular intervals, the government organizes awareness-raising campaigns and support projects for several aspects of ICT use. Under the ICT infrastructure programme, extra means are awarded to education institutions allowing them to purchase hardware, software and training packages. Teachers in Flanders do not use ICT on a daily basis to communicate with students or in student related activities. Their ICT use in class and as a tool in preparing lesson plans is infrequent, as shown in Figure 1. Secondary school teachers report greater frequency of using ICT and also tend to describe their own ICT skills as sufficient or good, a higher self-appraisal than primary school teachers who, on average, report themselves to be just



sufficient as seen in Figure 2. School management often think that teachers are more competent than teachers themselves do.



Figure 1: General use of ICT in primary and secondary schools (1: never, 2: a few times a year, 3: once or more times a month, 4: every week, 5: daily)

Figure 2

- 1. Not
- 2. A little
- 3. Sufficient
- 4. Good
- 5. Excellent

Gender	Primary	Secondary
Men	3.29	3.41
Women	2.78	3.23
Experience	Primary	Secondary
<= 5 year	2.96	3.37
6-10	2.94	3.58
6-10 11-18	2.94 2.65	3.58 3.36
6-10 11-18 19-24	2.94 2.65 2.37	3.58 3.36 3.19



3.3 ASPECT Teachers

Teachers have been asked to take part in ASPECT through the portal KlasCement. They were informed by different open calls (newsletters; website)

a)Newsletter timing:

2009 February: First mailing

2009-05-23: Small note to KlasCement members (about 28,000) subscribed to weekly newsletter

From: "KlasCement: Nieuwsbrief KC&Zo Weekend" < <u>info@klascement.net</u> > Date: Sat, 23 May 2009 08:01:17 +0200 To: Hans De Four < <u>hans@klascement.net</u> > Subject: KC&Zo - 23-05-2009 - 1003 (ver)nieuw(d)e bijdragen op KlasCement				
	KlasCement	Contact Info Steun Help	Hans De Four Mijn profiel	
	Nieuwsbrief KC&Zo Weekend - <u>Archief</u>			
	We zijn ook nog steeds op zoek naar: Inzendingen in de bouwsteen Multimedia, categorie Video. Je kan er een pracht-DVD mee winnen. Leerkrachten uit alle onderwijstypoes (wiskunde, wetenschappen & techniek) die zich de komende 20 maand drie dagen wensen te engageren in een Europees project ASPECT rond lesmateriaal, waarvan één dag in Protugal. Leerkrachten die een pilootproject i.v.m. video in de klas willen beoordelen en testen in het kader van het Europees project EduTubePlus. Meer info nodig, of interesse? Mail ons!			

Figure 1: First Announcement on KlasCement

2009-09-02: Personal mailing to everyone who replied to previous announcements 2009-09-08 Last call: <u>http://www.klascement.net/expo/nieuwsbrieven/archief/404</u>



Figure 2: Second Announcement on KlasCement

2009-09-11 deadline for the candidates



b)Questions & motivation:

Why should we select you?

In what way can you contribute?

What could be the return for you?

c)Selection Criteria

About 27 teachers asked for more information or applied to this call. **13 teachers + a focus group teacher** were selected based on the following criteria: Teaching subject: basic ICT experience, basic knowledge of English, science as a teaching subject; representing different educational levels; their motivation for wanting to participate and their nationality BE (Dutch).For the focus group teacher we also looked at participation in previous (European) projects.

After the first workshop (Oct. 2009) only one teacher dropped out. All the others attended till the end (Lisbon, March 2010).

Seven men and six women were selected as participants for the Belgian ASPECT school pilot experiments. Sixty-two percent of them had ten years or more of teaching experience. Most of the teachers had studied or were specialised in Science as a subject and taught students between the ages of 13 and 18 The biggest group of teachers taught Maths (60%), the rest of the teachers were split across different science subjects or other subjects.

	#number
Male	8
Female	6
Primary	2
Secondary	11
Higher	2
Maths	7
Chemistry	1
Physics	1
ICT	1
Technology	2
Other	2

Figure 3: Breakdown of teachers by subject



The selected teachers have a much higher use of ICT in all their teaching activities than the average teacher in Flanders as seen in Figure 4. Therefore, these teachers can be considered advanced ICT users and likely "early adaptors" of new techniques and technologies.



How often do you prepare teaching materials using ...?

Figure 4: Materials used when preparing lessons.

Figure 5 illustrates that Flemish teachers use computers and web materials infrequently with students and overwhelmingly rely on books for working with students.



How often do you use with your students ...?

Figure 5: Materials used with students.





How often do you (at home/or in the class room)?

Figure 6: Computer and internet use within a classroom or at home.

We can see from Figure 6 that Flemish teachers use Google, Wikipedia, Microsoft office and Microsoft Office almost every day. Lower percentages of teachers use other tools such as Open Office, Skype, social networking sites and Skype and chat. They rarely download from the internet. The Belgian teachers selected for the ASPECT project most often rely on PowerPoint presentations, images and other texts in their lectures.





What sort of materials you use?



How much have you ...?





About 60% of teachers use web materials "a lot" but only 30% have edited web materials. While most have shared materials with colleagues, they do not provide feedback on a regular basis.

Less than 40% have used Google on a daily basis to find materials for their lesson plans. Another 30% reported using Google only several times in the past year for lesson planning. None had ever used the Learning Resource Exchange before the testing and only 30% had used their own National portal (*KlasCement*).



We asked teachers to indicate what features of portals should be improved to support teachers in their daily tasks. Less than half were interested in ratings and recommendations from other users. All Belgian teachers wanted to see more efficient search tools to improve portal effectiveness as seen in Figure 9. Over 90% thought there was room for improvement in terms of ease of use for the portals and search engines they knew.



What sort of functionalities would be helpful...?

Figure 9: Portal functionalities relevant for the teachers.

Belgian teachers had collaborated with colleagues in their own schools to create web materials but few had collaborated with colleagues in other schools or outside their own country. However, close to 40% were willing to collaborate if given the opportunity. In figure 12 we see that Belgian teachers were all willing to share their materials with colleagues in their own schools and in international settings, although they were less willing to share with colleagues in their own geographical area. Eighty percent were interested in using materials from teachers outside their own country, while 60% said they would use materials from teachers in their own country.





Have you ever co-operated when creating web resources

Figure 11: Collaboration amongst teachers when creating web resources.



Sharing web materials with ...

Figure 12: Collaboration amongst teachers when sharing web materials.

■Whose materials would you use? ■Who would you give your materials to?


What sort of problems do you think you would face if you used materials produced in different countries or cultures?



Figure 13: Barriers of sharing materials produced in different countries.

Belgian teachers expressed a high degree of scepticism about the benefits of sharing materials with teachers outside of their country (Figure 13). More than half thought that curriculum compatibility would be a barrier to such sharing. Close to 40% were concerned about copyright issues. Uncertainty about where to find appropriate resources from other countries was of concern for 38% of the teachers and 31% thought it would take too much time to search for these kinds of resources as seen in Figure 14.



What kind of problems do you think will appear in co-operation between teachers from different countries?



Figure 14: Barriers of collaboration among teachers.

To understand what teachers meant when they discussed "quality" of content, we elicited opinions on the most important criteria for quality. Eighty-five percent of Belgian teachers agreed that quality meant a resource could be aligned with their curriculum and lesson plan. One hundred percent agreed or strongly agreed that quality meant a resource had an impact on learners as seen in Figure 15. In figure 16 we see that most of the teachers in the project initially trust resources that have received good rankings and most do not express any mistrust of resources only because they may be in a different language.





Quality for me means...

Figure 15: Meaning of "quality" for teachers.

I trust in resources...



Figure 16: When teachers trust in resources they found?

Flemish teachers trust in resources mostly when they have received good rankings, they have reviewed them themselves or when they come from an organization with a good reputation or even if the resources have been used often (figure 16).



When it comes to teachers' interest in contributing to the quality management of resources, close to 70% would be willing to contribute to reviewing resources and slightly more than half would rank resources using a scale system as seen in Figure 17. However, close to half the teachers were concerned that quality management can be a difficult task given that "quality" is so highly depended on context of use and it will be hard for a resource to be judged outside this context as seen in Figure 18.





Figure 17: Readiness for contributing to quality assurance.

Problems for contributing...?



Figure 18: Barriers contributing to quality assurance.





I find resources...

As we can see in figure 19, Flemish teachers mostly found resources by searching using keywords, browsing by subject or age, and browsing for resources with good rankings or when recommended by colleagues.

Main results: discovery of resources 3.4

Workshops 1 and 2 used questionnaires to elicit data on search and user satisfaction among teachers searching for learning resources and compared their behaviours using the ASPECT LRE portal vs. Google. Teachers who used the ASPECT LRE reported the most success in finding images for their lesson plans. Almost half the teachers also had success in finding simulations as seen in figure 19.



Did you find a certain type of

Figure 19: Resources found by the teachers to fit their lesson plans.

Figure 19: How teachers find resources before the tests





Figure 20: Different ways of finding the resource.

Searching by keyword was overwhelmingly the most common search strategy in successful searches with subject searches the second most successful as seen in figure 20.

3.5 Google vs. ASPECT LRE

To understand search behaviours and user satisfaction we administered a test to compare the time it took teachers to find the "same" resource using the ASPECT LRE or Google. This usability tests also illustrated teachers' search behaviours. For this, we had 4 resources we knew could be found in the ASPECT LRE. We called them BE, RO, LT and PT (the acronyms originate from the focus teacher that first found that resource). We provided the teachers with several characteristics of each resource and told them to find a resource via the ASPECT LRE and Google that best fitted these characteristics.

Flemish teachers were asked to find the RO, LT and PT resources, but not the BE, as they had seen the BE resource in an example lesson plan previously provided.

Teachers were given instructions to alternate the order in which they used the portals to look for the resources, as it would be reasonable to expect that the second time they looked for a resource (be it via Google or the ASPECT LRE) would take them less time.





Figure 21: Bars represent time it took the Flemish teachers to find the resources using Google or the ASPECT LRE. Prior to these tests, none of the participating teachers had any knowledge of the ASPECT LRE. [0,1] means up to 5 minutes, [1,2] means up to 10 minutes, [2,3] up to 15 minutes and [3,4] did not find the resource within the 15 minutes they had. Lines indicate average time it took the teachers to find the resource using the different portals.

Figure 21 represents the time Flemish teachers took to find those resources using Google vs. ASPECT LRE. On average, Flemish teachers found the resources with Google slightly faster, but in both cases they took between 10 and 15 minutes.

To understand how teachers viewed user generated tags and ratings, we elicited their opinions on whether they were interested in using these techniques in their own work with resources and whether they were likely to rely on this kind of information in their online search strategies.



Figure 22: Tags, recommendations and ratings.



In 100% of the cases, Flemish teachers used ratings to select resources, understood how they worked, and thought they were a good indicator of quality from the point of view of other teachers as seen in Figure 22.

In preparation for the next and final workshop where Moodle would play a prominent role, we asked teachers if they ever used this LMS. As figure 23 demonstrates, only 23% of Belgian teachers had ever used Moodle to create a course. This was a much lower use pattern than the total for all teachers participating in the project.



Figure 23: How often Flemish teachers have used Moodle to create a course

3.6 Building Lesson Plans with Packaged Content: SCORM and IMS Common Cartridge Formats

Teachers' reactions and use behaviour patterns with IMS Common Cartridge and SCORM were elicited during a workshop organised in May 2010 in Lisbon that brought all the teachers in the project together. User testing focused on the integration of resources into Learning Management Systems (LMS) and content packaging, in particular exploring how different types of "content packaging" can add value to the learning experience. The LMS used was Moodle. Teachers who had not experience with Moodle were provided with a basic training session in its use.

The workshop was built around three main tests, each of them followed by two types of feedback methods involving questionnaires and open discussions. All three tests were designed to serve both as a basic training on the use of different types of packaged content and their features (necessary as the teachers had no previous experience with this kind of content) and, at the same time, provided an opportunity to obtain teachers' reactions and interest levels in adopting packaged content in their classrooms.

All teachers underwent a training session on the use of Moodle and the integration of packaged resources in the LMS. Once they were familiar with this platform, we asked them to create the same lesson plan four times: 1) normal lesson plan using the Moodle learning platform in a "traditional" way, i.e., by combining different resources; 2) using a resource on the same topic that had been 'packaged' by ASPECT content developers



using the SCORM standard; 3) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the IMS Common Cartridge standard; and, finally, 4) just embedding parts of the IMS Common Cartridge.

For more than 55% of Belgian teachers it was reasonably easy to take parts of an IMS Common Cartridge to create lesson plans as seen in Figure 23. Creating lesson plans for 27% of them using web pages was "really easy" but none found that taking parts of IMS CC was "really easy".



Figure 24: Ease of use in creating a lesson plan.

In figure 25, we present the opinions of Flemish teachers on difficulties creating a forum using a normal web page, SCORM package, IMS common Cartridge package or taking parts of an IMS Common Cartridge package.



How difficult was it to create a forum...



Figure 25: **Difficulty creating a forum.**

In general, teachers found it as easy to create a forum using a normal webpage as when using an IMS Common Cartridge package; they found it slightly more difficult to use all or parts of IMS Common Cartridge package or a SCORM package. In fact, teachers found in more than 20% of the cases that it was quite complicated to take all or parts of an IMS Common Cartridge package to create a forum.

Figure 26 shows the opinion of Flemish teachers on their difficulties when creating a questionnaire using a normal web page, SCORM package, IMS common Cartridge package or taking parts of an IMS Common Cartridge package.



Figure 26: Difficulty creating a questionnaire



Flemish teachers were most comfortable with creating questionnaires using an IMS Common Cartridge package. More than half also found it reasonable to use web pages for the same purpose as seen in figure 26.



Figure 27: Benefits using SCORM or IMS Common Cartridge

Thirty-six percent of Flemish teachers found that it would be extremely helpful for them either to take an entire course in IMS Common Cartridge format and use it in Moodle or to take a piece of the learning resource from one of the IMS Common Cartridge packages and use it with other teaching materials. Flemish teachers were more likely to consider that all of the formats were helpful in limited cases, such as when giving students homework. This was particularly true for taking an entire course in SCORM format (figure 27).

Based on their experience in the workshop, we asked teachers to estimate whether they would be willing to use any of the formats even if it took some time to fully master their features. Their opinions are illustrated in figure 28 for using SCORM packages with Moodle and figure 29 for using IMS Common Cartridges with Moodle.



I think that using SCORM packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do
- I would loose time because I would still want to edit the parts and that would be really complicated



I think that using IMS CC packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do
- I would loose time because I would still want to edit the parts and that would be really complicated

Figure 29: Use of IMS Common Cartridge packages in Moodle.

For both SCORM and IMS Common Cartridge packages in Moodle, teachers were willing to invest some time into learning to use their features because they thought they would be ultimately beneficial. Slightly more of the teachers thought that IMS Common Cartridge was worth the time investment as seen in Figure 29.



Teachers' preferences changed depending on the kind of activity they intended to carry out using different formats. Fifty-five percent said they would prefer to use web pages when showing materials to students in class. On the other hand, when giving students online homework assignments, 55% preferred to use an IMS CC package in Moodle as seen in figure 30. Teachers also showed a significant preference for flexible materials that they can adapt over structured materials as seen in figure 31.



What is your interface preference if...

...you are just showing the materials to the students in your class?

...you are going to teach an entire online course?

...you are giving them online homework/extra credit work?

Figure 30: Interface preferences for different features.

Which do you prefer?



 Using an entire package (a course or a lesson) and following that materia in your teaching

Figure 31: Teachers preferences when choosing structured materials vs. flexible materials.



How important is the following content packaging issue to you?



Figure 32: How important is the following content packaging issue for Flemish teachers?

Eighty-two percent of teachers were most concerned that the packaged content was of high quality and 73% wanted direct access to eBooks on the topic. More than half wanted to have a significant amount of control over all the features, web content, interactive elements and assessment and feedback mechanisms for the teacher.

3.7 Access Control Mechanisms

The ASPECT LRE portal used during the last phase of testing supported three models for controlling the access to content: freely accessible content; licence-based access (i.e., the access to a collection of resources is granted to a group of users); and credit-based access (i.e., the access to some resources requires the use of some credit). Participating teachers were provided with some credits and asked to get resources available for free or for credit. After having been exposed to credit-based access, teachers were asked to think about the use of digital credits to buy or access digital online resources.

Figure 33 shows whether Flemish teachers or the schools buy online resources.



Do you (or does your school) currently buy resources online?



Figure 33: Do teachers (or schools) buy resources online?

How do you feel about using credits in order to access resources that are not free?



- I prefer to get resources for free and I don't think I would use credits
- I don't mind credit-based access as long as I'm given enough credits and don't have to purchase them
- I have no problems in using credits-based systems to access Digital Resources

Figure 34: Teachers' opinions about using credits in order to access to Digital Resources that are not free.

For the most part, teachers prefer to get resources for free (58%) but in 33% of the cases they don't mind credit-based access as long as they are given enough credits and they don't have to buy them (figure 34).

Figure 35 illustrates whether they are interested in sharing their resources for credits or for other kinds of compensation.



Do you...?



Figure 35: Teachers' motivations for creating resources.

All Flemish teachers create their own learning resources. Only 17% teachers said they would consider charging for their resources.

Figure 36 shows how Flemish teachers feel about credit-based access to materials, if they could gain credits by rating other people's resources or providing feedback on them. Figure 37 shows how Flemish teachers feel about credit-based access to materials, if they could gain credits by uploading resources they had created to the platform.



Figure 36: How do Flemish teachers feel about credit-based access to materials, if they could gain credits by rating other people's resources or providing feedback on them?



How do you feel about credit-based access to materials, if you could gain credits by uploading resources you had created to the platform?



- I would definitely use this approach to gain credits myself It would be the natural way: I give some, I get some.
- Interesting idea, but I would like to try to first to see what it involves
- I'm not sure if I would use this approach myself
- Sounds like too much work for me
- I wouldn't want to share my content with others

Figure 37: How do Flemish teachers feel about credit-based access to materials, if they could gain credits by uploading resources they had created to the platform?

To understand how teachers respond to credit based systems we proposed two options for them to earn credits. First, teachers could gain credits by rating other people's resources or providing feedback to them. Second, teachers could gain credits by uploading to the platform resources they had created. In both cases, 58% of the Flemish teachers said they would mostly use both approaches to gain credits. 33% of the cases teachers thought both are good ideas, but said they would like to try them first to see what this involves. Also in both cases, 8% of the teachers thought that would be too much work for them.

3.8 Conclusion

In Belgium, 13 teachers from the Flemish community participated in the ASPECT project. Most of the teachers had many years of teaching experience. Flemish teachers spend quite a lot of time on the computer, an average of at least 30 minutes every day; the majority spend between 1 and 2 hours a day.

Flemish teachers used mostly Google to search for materials. After Google, they used their National portal (*KlasCement*) - at least once a week in some cases.

Flemish teachers did not often engage in editing materials they found online but, once they were introduced to various features of packaged content, they thought that the time invested in learning how to use these would be worthwhile. They preferred flexible formats that allowed them greatest control of all the features of the content and that enabled them to reuse a variety of content tailored for different teaching and learning contexts.



4 Lithuania

4.1 Introduction

This report provides the data collected from experiments conducted with 9 Lithuanian teachers of Science subjects who took part in three separate ASPECT school pilot workshops. The report includes: background information on the teachers selected for the experiments; data we gathered on teachers' search behaviours and satisfaction with the ASPECT LRE portal vs. Google; teachers' attitudes toward learning resource reuse and sharing of resources; and teachers' feedback on packaged content in SCORM and IMS Common Cartridge formats. The procedures, tasks, tests and questionnaires are described in detail in deliverable D-6.5. Workshop 1 with Lithuanian teachers took place Vilnius (Lithuania), Sat 24 Oct 2009 eliciting teachers' feedback on search tools and collecting data on teachers' search behaviours. The second workshop was carried out online in March 2010 covering content discovery as well as the functionalities of the ASPECT LRE portal vs. Google. The third workshop was a joint summer school for 45 teachers from all four countries in May 2010.

4.2 Teachers and ICT

Although Lithuania has its own repository run by the Centre of Information Technologies in Education (ITC) and is available in Lithuanian and English, it is not widely used in Lithuania.

According to the Ministry of Education and the School Improvement Programme in 2009-2010, the total number of teachers in Lithuania is 39,842 of which 1486 are Primary School teachers and 13,961 are Secondary School teachers. The percentage of Science teachers is 7.8% and 87% are female teachers. All schools in Lithuania are equipped with computers, and the internet is available in 99% of the schools. There are1052 Physics teachers, 768 Chemistry teachers, 1123 Biology teachers and also they have an integrated course of Natural and Human Sciences with 153 teachers in Lithuanian schools. On average, there are 19 students in Science classes.

Lithuanian teachers have access to a national portal run by the Centre of Information Technologies in Education (ITC), an educational institution founded by the Ministry of Education and Science of the Republic of Lithuania. This national portal is available in both Lithuanian and English. Currently, it has 900 users. The Ministry of Education and Science of the Republic of Lithuania encourage the use of their national portal by organizing information days about the portal and seminars. Teachers can upload their content. The national portal does not offer content in SCORM or IMS Common Cartridge formats. Beginning in 2004, the national portal was connected to the Moodle Learning Management System (http://vma.emokykla.lt/moodle/).Currently, 2.2% of Lithuanian teachers use this platform. While very few teachers use Moodle to prepare lessons on a regular basis, Moodle has proven its usefulness for distance learning, in cases when teachers provide lessons for students who are ill for extended periods of time, for students who are away from Lithuania but continue their studies, and in cases when teachers provide Moodle courses for talented students.



The Ministry of Education and Science of the Republic of Lithuania organizes training for the teachers and it also funds the development of new Moodle courses and distance teacher training. There is also funding available for portals or for teachers to register to a portal and to buy resources.

4.3 ASPECT Teachers

The Centre of Information Technologies in Education invited teachers of Mathematics, Biology, Chemistry, Physics and Information Technology to participate in the ASPECT project. Selection was based on:, teachers' interest in innovation; their experience in other international project related to ICT; experience in the use of ICT resources in lesson planning; and a basic knowledge of English.

Nine teachers of Science were selected for participation in the ASPECT school pilots (six women and four men). Sixty percent of those selected for the ASPECT experiments were experienced teachers (teaching 10 years or more). Most of the teachers involved were between 30 and 55 years of age and the majority were teaching students 13 to 18 years of age. Forty percent of selected teachers taught courses in Information Technology and the rest taught other science subjects such as Physics, Chemistry, Maths and Biology. Most reported English skills at a basic level and proficiency in Russian.



Your school has

Figure 1: IT infrastructure at schools.

All schools have internet access and a computer lab for the students. Fifty percent of the schools have only one computer to be shared among all teachers and only 10% of the schools have a computer for every teacher. More than half of the schools have an interactive whiteboard in some of the classes and a projector or PC in each class.

Seventy percent of teachers selected for the ASPECT user tests reported spending, on average, 4 hours a day using a computer and all the participants have internet access at home. As we see in Figure 2, 80% of Lithuanian ASPECT teachers classify themselves as possessing advanced IT knowledge. Female participants were more confident in their IT skills than their male counterparts. A very high percentage of teachers use



computers to prepare their lessons on a daily basis. Seventy percent use web materials on both a weekly and daily basis as seen in figure 3. They report using web materials with students much less often (figure 4), probably due to the fact that most teachers have to share one computer with all their colleagues.



Figure 2: IT knowledge of Lithuanian teachers based on use of different tools like Skype, VLE, social networks, participation on forums and knowledge of html.



How often do you prepare teaching materials using ...?

Figure 3: Materials used when preparing lessons.





How often do you use with your students ...?





How often do you (at home/or in the class room)?

Figure 5: Computer and internet use within a classroom or at home.





What sort of materials you use?

Figure 6: Type of materials teachers use in the lectures.

All the teachers reported using PowerPoint presentations and images along with assignments, tests and images for lesson plans. Sixty percent use videos and the other forty percent would like to use them more often as shown in figure 6.

Sixty percent of Lithuanian teachers use Google to find resources online. None of the participating teachers had any knowledge of their own national portal or the ASPECT LRE portal.

As Figure 7 demonstrates 80% of Lithuanian teachers edit materials they find and most of them use materials found on the web for class materials.



How much have you ...?

Figure 7: Use of Materials Found Online.



As figures 8 and figures 9 demonstrate, while only 10% of teachers have had the opportunity to collaborate with a colleague in another country, 80% would be interested in doing so when sharing resources they created from web materials.



Have you ever co-operated when creating web resources





Sharing web materials with...

Figure 9 Collaboration amongst teachers when sharing web materials.



We asked teachers to think about the possible problems they might confront when using materials produced in countries outside of Lithuania. As figure 10 demonstrates, 80% of Lithuanian teachers had concerns that curriculum differences would be a barrier to reusing resources from other countries.



Figure 10: Barriers of sharing materials produced in different countries.

We also asked what kind of problems teachers foresaw collaborating with teachers from different countries. As we see in Figure 11, the most common barrier (60% of teachers thought this to be true) was their presumption that they needed better English skills in order to collaborate in an international context.



What kind of problems do you think will appear in co-operation between teachers from different countries?



Figure 11: Barriers of collaboration among teachers.



4.4 Search Behaviour and User Satisfaction



Quality for me means...

Figure 12: Meaning of "quality" for teachers.

To understand what teachers meant when they discussed "quality" of content, we elicited opinions on the most important criteria for quality. Eighty percent strongly agreed that quality was synonymous with a resource that had a clear impact on learners. Another 90% agreed or strongly agreed that quality meant that resources were scientifically correct as illustrated in figure 12. We also asked them to explain how they initially know they can trust a found resource. For all Lithuanian teachers, the reputation of the content provider produced a high trust factor. As seen in figure 13, only 50% initially trusted resource as seen in figure 13.





I trust in resources...

Figure 13: When do teachers trust in resources they found?



I find resources...

Figure 14: Where do the teachers find resources from?

As shown in figure 14, all participating Lithuanian teachers relied on recommendations from colleagues and browsing to find resources. Ninety percent of them relied on keyword searching to find resources as well.



4.5 Main results: discovery of resources - Lithuania

Workshops 1 and 2 used questionnaires to elicit data on search and user satisfaction among teachers searching for learning resources and compared their behaviours using the ASPECT LRE portal vs. Google. Sixty percent of Lithuanian teachers reported successful searches of the ASPECT LRE portal for images to fit their lesson plans. Simulations were also found by 50% of the teachers, as seen in figure 15. Sixty percent of teachers used keywords in their successful searches for images as seen in figure 16.



Did you find a certain type of resource to fit your lesson plan?

Figure 15: Resources found by the teachers to fit their lesson plans.





Figure 16: Different ways of finding the resource.

In most of the cases, resources were found when teachers searched via keywords or subjects. This is mainly the traditional way of finding resources, and seems to be teachers want. It is important to note that they didn't find any resources when recommended or tagged by others.

Given that the Lithuanian teachers had no previous knowledge of the ASPECT LRE portal, we asked them to assess its features and point out which features they liked best. As seen in figure 17, teachers liked the availability of information about different kinds of resources (100% liked the descriptions they found of applets) and they also appreciated the ability to search for resources in different languages (90% of teachers).





Figure 17: Features of ASPECT LRE portal

4.6 Google vs. ASPECT LRE

To understand search behaviours and user satisfaction, we administered a test to compare the time it took teachers to find the "same" resource using the ASPECT LRE or Google. This usability test also illustrated teachers' search behaviours. For this, we had 4 resources we knew could be found in the ASPECT LRE. We called them BE, RO, LT and PT (the acronyms originate from the focus teacher that first found that resource). We provided the teachers with several characteristics of each resource and told them to find a resource via the ASPECT LRE and Google that best fitted these characteristics. Lithuanian teachers were asked to find the BE, RO and PT resources, but not the LT, because they had seen the LT resource in an example lesson plan we provided. Teachers were given instructions to alternate the order in which they used the portals to look for the resources, as it would be reasonable to expect that the second time they looked for a resource (be it via Google or the ASPECT LRE) would take them less time.





Figure 18: Bars represent time it took the Lithuanian teachers to find the resources using Google or the LRE. [0,1] means up to 5 minutes, [1,2] means up to 10 minutes, [2,3] up to 15 minutes and [3,4] did not find the resource within the 15 minutes they had. Lines indicate average time it took the teachers to find the resource using the different portals.

Figure 19 shows what options Lithuanian teachers used in order to search for resources.



Figure 19: Options Lithuanian teachers used when searching for the resources.

We can see that, on average, when these teachers searched by subject or via target group, they took less time to find resources in Google than with the ASPECT LRE portal. However, when they searched via keywords, they took less time with the ASPECT LRE portal than with Google.



To understand how teachers viewed user generated tags and ratings, we elicited their opinions on whether they were interested in using these techniques in their own work with resources and whether they were likely to rely on this kind of information in their online search strategies.



Figure 20: Tags, recommendations and ratings.

Lithuanian teachers are fully aware of tagging and rating systems. In 100% of the cases, (figure 20):

- Teachers can see themselves tagging resources or adding them to favourites in the future.
- Teachers found tagging very useful because they can find resources they liked quickly.
- They could give ratings to resources they have reviewed.
- They trust more ratings done recently
- They trust the rating if given by someone they know
- They consider ratings when they are choosing.
- They find both ratings and tagging useful.

In preparation for the next and final workshop where Moodle would play a prominent role, we asked teachers if they had ever used this Learning Management System.





Figure 21: How often Lithuanian teachers have used Moodle to create a course.

As we see in figure 21, Lithuanian teachers have used Moodle to create a course on numerous occasions, compared with average for all the teachers taking part in the ASPECT project testing.

4.7 Building Lesson Plans with Packaged Content: SCORM and IMS Common Cartridge Formats

Teachers' reactions and use behaviour patterns with IMS Common Cartridge and SCORM were elicited during a workshop organised in May 2010 in Lisbon that brought together all the teachers in the project. User testing focused on the integration of resources into Learning Management Systems (LMS) and content packaging, in particular exploring how different types of "content packaging" can add value to the learning experience. The LMS used was Moodle. Teachers who had not experience with Moodle were provided with a basic training session in its use.

The workshop was built around three main tests, each of them followed by two types of feedback methods involving questionnaires and open discussions. All three tests were designed to serve both as a basic training on the use of different types of packaged content and their features (necessary as the teachers had no previous experience with this kind of content) and, at the same time, provided an opportunity to obtain teachers' reactions and interest levels in adopting packaged content in their classrooms.

All teachers underwent a training session on the use of Moodle and the integration of packaged resources in the LMS. Once they were familiar with this platform, we asked them to create the same lesson plan four times: 1) normal lesson plan using the Moodle learning platform in a "traditional" way, i.e., by combining different resources; 2) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the SCORM standard; 3) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the IMS Common Cartridge standard; and, finally, 4) just embedding parts of the IMS Common Cartridge.





Figure 22: Difficulty creating a lesson plan.

As we see in figure 22, 27% Lithuanian teachers found it really easy to create a lesson plan using a normal web page and only 9% found it really easy to use an IMS Common Cartridge package or taking parts of it. Using an IMS CC package and web pages was reasonable for another 45% of teachers. A large proportion (64%) of teachers encountered 'some problems' taking parts of an IMS Common Cartridge package.

When it came to creating a forum using normal web pages, a SCORM package, an IMS common Cartridge package or by taking parts of an IMS Common Cartridge package, less then forty percent of teachers encountered "some problems" as seen in figure 23.



How difficult was it to create a forum...



Figure 23: Difficulty creating a forum.

Figure 24 shows the opinions of Lithuanian teachers on their difficulties when creating a questionnaire using a normal web page, SCORM package, IMS common Cartridge package or taking parts of an IMS Common Cartridge package.



Figure 26: **Difficulty creating a questionnaire.**



Figure 26 demonstrates that less than 10% considered creating questionnaires really easy with any of the formats. Slightly more teachers reported that web pages were "reasonable" to work with for this task in comparison to the other formats.



Figure 27: Benefits using SCORM or IMS Common Cartridge.

Lithuanian teachers found that the best option for them would be to take a piece of the learning resource from one of the IMS Common Cartridge packages and use it with other teaching materials.

Figures 28 and 29 illustrate teachers' willingness to invest time in learning to use features of SCORM and IMS CC formats. Fifty five percent of teachers thought that, although they would initially loose time working with IMS CC formats, it was worth the investment. For SCORM, 45% thought it was worth the time investment to master the features.


I think that using SCORM packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do
- I would loose time because I would still want to edit the parts and that would be really complicated

Figure 22: Use of SCORM packages with Moodle.

I think that using IMS CC packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do
- I would loose time because I would still want to edit the parts and that would be really complicated

Figure 29: Use of IMS Common Cartridge packages in Moodle.





What is your interface preference if...

Figure 30: Interface preferences for different features.

Teachers' preferences regarding interfaces were mixed. No single format garnered a majority of teachers as a preferred interface in different kinds of teaching activities. As illustrated in figure 30, 45% of Lithuanian teachers thought that IMS CC packages in Moodle would be useful for teaching an entire online course and 36% of them also thought it would be useful for giving students online homework assignments and extra credit.



Which do you prefer?



Figure 31: Teachers preferences when choosing structured materials vs. flexible materials.

Seventy-three percent of teachers preferred to use bits of materials they found online and mix them with other materials as seen in figure 31.



For 55% percent of teachers, the quality of the content was of vital importance (figure 31).



How important is the following content packaging issue to you?

Figure 31: How important is the following content packaging issue for Lithuanian teachers?

4.8 Access Control Mechanisms

The ASPECT LRE portal used during the last phase of testing supported three models for controlling access to content: freely accessible content; licence-based access (i.e., the access to a collection of resources is granted to a group of users); and credit-based access (i.e., the access to some resources requires the use of some credit). Participating teachers were provided with some credits and asked to get resources available for free or for credit. After having been exposed to credit-based access, teachers were asked to think about the use of digital credits to buy or access digital online resources.

Most of the teachers (90%) indicated that their schools buy resources online, as seen in figure 32. When asked if they were interested in a credit-based system, 80 indicated that they were interested but it was important for them that they receive credits without having to pay for these as seen in figure 33.



Do you (or does your school) currently buy resources online?



Figure 32: Do teachers (or schools) buy resources online?

How do you feel about using credits in order to access resources that are not free?



- I prefer to get resources for free and I don't think I would use credits
- I don't mind credit-based access as long as I'm given enough credits and don't have to purchase them
- I have no problems in using credits-based systems to access Digital Resources

Figure 33: Teachers' opinions about using credits in order to access to Digital Resources that are not free.





Do you...?

Figure 34: Teachers' motivations for creating resources.

All Lithuanian teachers created their own learning resources and in 90% of the cases said they will continue doing so. Seventy percent said they would not mind sharing their own resources if they received other resources in exchange. Forty percent of teachers were interested in being paid for sharing their resources.

In order for teachers to gain credits, we made two proposals. First, teachers could gain credits by rating other people's resources or providing feedback on them. Second, teachers could gain credits by uploading resources they had created. Figure 35 illustrates that 80% of Lithuanian teachers are interested in earning credits by providing ratings and feedback on other people's resources. Ninety-percent would agree to a credit system that would allow them to upload their own resources in exchange for other resources as seen in figure 36.



How do you feel about credit-based access to resources if you could gain credits by rating other people's resources or providing feedback on them?



- I would definitely use this approach to gain credits myself It would be great to 'earn' credits by reviewing and not having to pay money for them
- Interesting idea, but I would like to try to first to see what it involves
- I'm not sure if I would use this approach myself
- Sounds like too much work for me
- I don't see any benefits in rating content (for example with stars) or giving feedback on them

Figure 35: How do Lithuanian teachers feel about credit-based access to materials, if they could gain credits by rating other people's resources or providing feedback on them?



How do you feel about credit-based access to materials, if you could gain credits by uploading resources you had created to the platform?



- I would definitely use this approach to gain credits myself It would be the natural way: I give some, I get some.
- Interesting idea, but I would like to try to first to see what it involves
- I'm not sure if I would use this approach myself
- Sounds like too much work for me
- I wouldn't want to share my content with others

Figure 36: How do Lithuanian teachers feel about credit-based access to materials, if they could gain credits by uploading resources they had created to the platform?

4.9 Conclusion

In Lithuania, 9 teachers participated in the ASPECT project. Most had many years of teaching experience as well as high rates of computer literacy and regular use patterns of web materials and Moodle. Lithuanian teachers were more successful and satisfied with their searches using Google vs. the ASPECT LRE. Lithuanian teachers preferred to create lesson plans, forums or questionnaires using a normal web page rather than IMS Common Cartridge or SCORM. They were interested in using any format that could allow them to modify and edit content rather than using a structured packaged.



5 Romania

5.1 Introduction

This report provides the data collected from experiments conducted with 10 Romanian science teachers who took part in three separate ASPECT school pilot workshops. The report includes: background information on the teachers selected for the experiments; data we gathered on teachers' search behaviours and satisfaction with ASPECT LRE portal vs. Google; teachers' attitudes toward learning resource reuse and sharing of resources; and teachers' feedback on packaged content in SCORM and IMS Common Cartridge formats. Workshop 1 with Romanian teachers took place in Bucharest on Saturday, 31 Oct 2009 eliciting teachers' feedback on search tools and collecting data on teachers' search behaviours. The second workshop was carried out online in March 2010 covering content discovery as well as the functionalities of the ASPECT LRE portal vs. Google. The third workshop was a joint summer school for 45 teachers from all four countries in May 2010.

The procedures, tasks, tests and questionnaires are described in detail in deliverable D-6.5. All materials were translated from English to Romanian in preparation for work with Romanian teachers.

5.2 Teachers and ICT

The Ministry of Education, Research, Youth and Sports in Romania aims to raise the level of usage of ICT resources in education to state-of-the-art standards, in order to accomplish the educational reform objectives that conform with the EU strategies: eEurope 2005, eLearning European Initiative, i2010.

SEI - the IT-Based Education System is a complex program initiated by the Romanian Ministry of Education, Research, Youth and Sports and, since its inception in 2001, has been integrated as a key component of education reform in Romania. It focuses on the digital literacy of young people, as well as ICT support for teaching/learning management activities. Introducing ICT resources in the Romanian schools represented a mandatory step in creating a knowledge society that is competitive at European and global levels. Romania has 275,000 employed teachers and 2.8 million students enrolled in primary, secondary, vocational schools and high schools.

SEI was designed as a complete nationwide solution, composed of an integrated network of local and regional solutions. Each IT laboratory provided to schools is itself an integrated solution, ready to be used by teachers and pupils. The IT laboratories (local solutions) are integrated into a logical network comprising all the schools in a region. All regions are integrated into a national network connected to and coordinated by the project management unit. Thus, the SEI project has a strong impact at different levels of users, from the individual student to each school, to County School Inspectorate, and to the Ministry level. Teachers can use ICT support for testing, for evaluation and grading, and to collaborate with other teachers, with students and parents.

The SEI Educational Portal is the main web-based communication platform between the education management, teachers, pupils, parents, regional and school administration and the general public. With 160,000 registered users on http://portal.edu.ro and 2,500,000 unique visitors per month, the portal represents the most important source of information, collaboration and communication in education and includes a large series



of individual web sites, including educational resources, interactive digital educational content and information about education projects, examinations, etc. In July 2010, the portal has been the most accessed on-line source of information, gathering 5,248,491 visitors. With over 160,000 registered users, the forum of the SEI portal is the most likely meeting place for all those involved in the Romanian education system.

13,181 Romanian schools currently have at least one IT laboratory. Every lab is composed of the following elements: 5 to 25 workstations (desktops or laptops), servers, infrastructure for internet connections, the AeL Platform (Learning Management System, and other productivity software.

The extent to which teachers are familiar with ICT and their use in the educational process is confirmed by the following results:

a) More than 95% of the teachers in high school and gymnasium education, as well as almost 70% of the teachers in primary education use the provided SEI laboratories.

b) 17% of the teachers organize more than 6 lessons per semester in the laboratory, the most frequent situation being that of the lesson (in gymnasium) in a SEI laboratory with AeL installed.

SEI Program included:

- Installation and configuration in each school of a complete educational solution for the teaching/learning process composed of IT laboratories equipped with eLearning solutions, school administration software and eContent library.
- Elaboration of 3,647 AeL eContent lessons (totalling 16,000 reusable learning objects) and 16 dictionaries: explanatory, orthographic, synonyms, antonyms, Romanian-English-French etc.; encyclopaedias and glossaries of terms, movies. According to traffic statistics, the SEI portal was ranked 1st in Romanian websites, at both general and education categories, registering over 2.6 million visitors and over 78 million posted web pages.

As part of the AeL platform implementation, over 140,000 teachers have been trained in each school. Hundreds of training sessions for expert teachers and school inspectors were held. All schools were targeted in information campaigns, which included direct mailing, visual, audio and printed media. Contests and other activities for students and teachers were organized. Training courses were introduced in life-long learning curricula for teachers (general computer skills and AeL usage in educational process).

5.3 ASPECT Teachers

Two men and eight women were selected to participate in the ASPECT testing. Half the teachers selected had more than 20 years of teaching experience and 40% more than 10. Seventy percent of them were over the age of 40. Most teachers worked with children from 7 to 18 years of age and the most common subject taught was Maths (30%) and Physics and Biology (20% each). Half had either basic French or English language skills. They reported regularly using computers and half the participating teachers reported using Google every day to search for learning resources. None had any knowledge of the ASPECT LRE portal before the tests. All of their schools had internet access but only



65% taught in schools with a computer lab. Sixty percent of participating teachers used their National portal (*School Map Portal*) to search for materials but only one of the participants used it regularly.

One quarter of the teachers taught in schools where 1 computer was shared among all teachers as seen in Figure 1.



Figure 1: IT infrastructure at schools.



Figure 2: IT knowledge of Romanian teachers based on use of different tools like Skype, VLE, social networks, participation on forums and knowledge of html.

Half the teachers classified their IT knowledge as "normal" as seen in Figure 2. Forty percent of Romanian teachers participating in the ASPECT project use web materials weekly and daily in preparing lessons as seen in Figure 3. Seventy percent of the teachers use web materials with their students on a weekly basis as seen in Figure 4.





How often do you prepare teaching materials using ...?

Figure 3: Materials used when preparing lessons.

How often do you use with your students ...?



Figure 4: Materials used with students.



Figure 5 illustrates computer use patterns among participating teachers. All the teachers used computers everyday to check email. Seventy five percent of them had never engaged in computer programming.



How often do you (at home/or in the class room)?

Figure 5: Computer and internet use within a classroom or at home.



Figure 6 demonstrates that Romanian teachers rely on a variety of materials and techniques in their lectures.



What sort of materials you use?

Figure 6: Type of materials teachers use in the lectures.

Most of the Romanian teachers had little experience in editing the web materials they found although more than half reported using web materials a lot, as seen in figure 7. Close to half had only rarely provided feedback on other's materials.

How much have you ...?



Figure 7: Use of Materials Found Online



Half the Romanian teachers have cooperated with colleagues in their own school when creating web resources. Only one had never cooperated on these tasks and none had ever done so with a colleague in another country, as seen in figure 8. In figure 9 we see that half the Romanian teachers would use materials from teachers in their own school but 60% would use materials created by teachers outside Romania.



Have you ever co-operated when creating web resources





Sharing web materials with ...

Figure 9: Collaboration amongst teachers when sharing web materials.

We asked teachers to think about the possible problems they might confront when using materials produced in countries other than their own. As figure 10 demonstrates, 60% of teachers thought that didactic differences would cause problems in sharing materials



from different countries and the same percentage thought that the materials would be available only in unfamiliar interfaces.





Figure 10: Barriers of sharing materials produced in different countries.

What kind of problems do you think will appear in co-operation between teachers from different countries?



Figure 11: Barriers of collaboration among teachers.



Forty percent of teachers thought that cooperation would be difficult if they could not meet their collaborators personally and thirty percent were not sure they could trust the quality of the materials produced in such collaborations, as seen in Figure 11.



5.4 Search Behaviours and User Satisfaction

Figure 12: Meaning of "quality" for teachers.

To understand what teachers meant when they discussed "quality" of content we elicited opinions on the most important criteria for quality. Ninety percent strongly agreed that quality was synonymous with a resource that had a clear impact on learners. All teachers "strongly agreed" that quality meant that resources were scientifically correct (as illustrated in figure 12). We also asked them to explain how they initially know they can trust a found resource. Eighty percent trusted resources based on the content provider's reputation and the rankings of the resource provided by reviewers. Ninety percent trusted resources only after they reviewed them on their own as seen in figure 13.





I trust in resources...

Figure 13: When do teachers trust in resources they found?



I find resources...

Figure 14: Where do the teachers find resources from?

As we can see in figure 14, all Romanian teachers found resources using recommendations from colleagues and by searching using keywords. Less common but still prevalent was browsing by subject.



5.5 Main results: discovery of resources

Workshops 1 and 2 used questionnaires to elicit data on search and user satisfaction among teachers searching for learning resource and compared their behaviours using the ASPECT LRE portal vs. Google.

Half the teachers had successful searches for images using the ASPECT LRE portal seen in figure 15. Searches for other types of resources had significantly lower success rates among these teachers. Figure 16 illustrates the search strategies employed by Romanian teachers looking for lesson plan materials.



Did you find a certain type of resource to fit your lesson plan?

Figure 15: Resources found by the teachers to fit their lesson plans.







Seventy percent of teachers found images by searching using the ASPECT LRE subject search feature which was more successful than using the keyword search to find images. Most Romanian teachers liked the web links available via the ASPECT LRE portal and the subject search features as illustrated in figure 17.



Did you...?

Figure 17: Positive features on LRE portal.

For the second test, we wanted to compare the time it took teachers to find the "same" resource using the ASPECT LRE or Google, and how the searches were carried out. We had 4 resources we knew could be found in the LRE. We called them BE, RO, LT and PT (the origin of the names comes from the focus teacher that originally found that resource). We provided the teachers with several characteristics of each resource and told them to find a resource via the LRE and Google which fitted the characteristics the most. Romanian teachers were asked to find the BE, LT and PT resources, but not the RO, as they has seen the RO resource in an example lesson plan we provided.

Teachers were given instructions to alternate the order in which they used the portals to look for the resources, as it would be reasonable to expect that the second time they looked for a resource (be it via Google or the ASPECT LRE) would take them less time.





Figure 18: Bars represent time it took the Romanian teachers to find the resources using Google or the LRE. [0,1] means up to 5 minutes, [1,2] means up to 10 minutes, [2,3] up to 15 minutes and [3,4] did not find the resource within the 15 minutes they had. Lines indicate average time it took the teachers to find the resource using the different portals.

As illustrated in figure 18, Romanian teachers found the resources with Google in less time than with the ASPECT LRE, but, in both cases, they took less than 10 minutes.

Figure 19 demonstrates the search strategies of Romanian teachers in this test that compared Google and the ASPECT LRE.



Figure 19: Options Romanian teachers used when searching for the resources.

Searching using keywords took more time on both Google and the ASPECT LRE than searching by subject or using target group. In all cases it took slight longer to search using the ASPECT LRE portal.



Figure 20 shows Romanian teachers knowledge and opinions about tagging, recommendations and ratings.



Figure 20: About tags, recommendations and ratings.

Romanian teachers are fully aware about how tagging and ratings work. In more than 90% of the cases:

- Teachers can see themselves tagging resources or adding them to favourites in the future.
- They trust the rating if given by someone they know
- Teachers found tagging very useful because they can find resources they liked fast.
- They could give ratings to resources they reviewed.
- They trust more ratings done recently.
- They considered ratings when they are choosing.
- They found both ratings and tagging useful.

In preparation for the next and final workshop, where Moodle would play a prominent role, we asked teachers if they ever used this LMS to create a course.





Figure 21: How often Romanian teachers have used Moodle to create a course

As we see from figure 21, only 17% of Romanian teachers had used Moodle to create a course. The average use for all teachers of the ASPECT project is 46%.

5.6 Building Lesson Plans with Packaged Content: SCORM and IMS Common Cartridge Formats

Teachers' reactions and use behaviour patterns with IMS Common Cartridge and SCORM were elicited during a workshop organised in May 2010 in Lisbon that brought all the teachers together. User testing focused on the integration of resources into Learning Management Systems (LMS) and content packaging, in particular exploring how different types of "content packaging" can add value to the learning experience. The LMS used was Moodle. Teachers who had no experience with Moodle were provided with a basic training session in its use.

The workshop was built around three main tests, each of them followed by two types of feedback methods involving questionnaires and open discussions. All three tests were designed to serve both as a basic training on the use of different types of packaged content and their features (necessary as the teachers had no previous experience with this kind of content) and, at the same time, provided an opportunity to obtain teachers' reactions and interest levels in adopting packaged content in their classrooms.

All teachers underwent a training session on the use of Moodle and the integration of packaged resources in the LMS. Once they were familiar with this platform, we asked them to create the same lesson plan four times: 1) normal lesson plan using the Moodle learning platform in a "traditional" way, i.e., by combining different resources; 2) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the SCORM standard; 3) using a resource on the same topic that had been 'packaged' by ASPECT content developers using the IMS Common Cartridge standard; and, finally, 4) just embedding parts of the IMS Common Cartridge.





Figure 22: Difficulty creating a lesson plan.

As we see in figure 22, 36% percent of teachers found some problems in using IMS Common Cartridge packages and taking parts of the packages to build lesson plans. Fifty five percent thought this was a really easy task when using web pages and another 55% thought it was reasonably easy to take parts of IMS Common Cartridge package to create lesson plans.

When it came to creating a forum using different formats, eighty percent of the teachers thought using SCORM was reasonably easy and seventy percent thought that using web pages was really easy as seen in figure 23. Similarly, 90% of Romanian teachers thought using the SCORM format was "reasonable" for creating questionnaires, while 50% thought it was really easy to use web pages for creating questionnaires.



How difficult was it to create a forum...



Figure 23: Difficulty creating a forum.

How difficult was it to create a questionnaire...



Figure 24: Difficulty creating a questionnaire.

Most Romanian teachers were enthusiastic about using Moodle when teaching and thought that using content packages could be helpful in cases when they were giving homework or teaching online as seen in figure 25.





How big of a benefit do you see when...

Figure 25: Benefits using SCORM or IMS Common Cartridge.

Figures 26 and 27 illustrate teachers' willingness to invest time in learning to use features of SCORM and IMS Common Cartridge formats. Forty five percent thought it was worth the time to learn more about SCORM while 65% thought it was worth the time investment to learn to use content packaged using IMS Common Cartridge.



I think that using SCORM packages in Moodle...



- I would save time because I wouldn't have to import all the texts, pictures, videos & so on individually, but I would get the whole package at once
- It would take more time at first, but once I would learn how to do it properly - I think it would start saving me time
- I would loose time because it's just too difficult for me to do

Figure 26: Use of SCORM packages with Moodle.

I think that using IMS CC packages in Moodle...



- properly I think it would start saving me time
- I would loose time because it's just too difficult for me to do

Figure 27: Use of IMS Common Cartridge packages in Moodle.

More than half the Romanian teachers preferred flexible materials to build and edit lesson plans over structured material, as seen in figure 28.





What is your interface preference if...

- ...you are just showing the materials to the students in your class?
- ...you are going to teach an entire online course?
- ...you are giving them online homework/extra credit work?

Figure 28: Interface preferences for different features.

Half of the Romanian teachers thought that IMS Common Cartridge in Moodle was useful for teaching an entire course online and 45% thought this format in Moodle was appropriate also for giving homework and extra credit work.



Which do you prefer?

- Using bits of materials you find in the web and mixing them with other materials
- Using an entire package (a course or a lesson) and following that material in your teaching

Figure 29: Teachers preferences when choosing structured materials vs. flexible materials.

Romanian teachers in 64% of the cases said they would prefer to use an entire package and follow that material in their lessons compared with 36% teachers who said they



would prefer using bits of materials they found in the web and mixing them with other materials.

How important is the following content packaging issue to you?



Figure 30: How important is the following content packaging issue for Romanian teachers?

For 90% of Romanian teachers high quality materials were of vital importance in content packaging. Eighty percent of teachers also thought it was a vital issue to be able to include web content and simulation in the packages.

5.7 Access Control Mechanisms

The ASPECT LRE portal used during the last phase of testing supported three models for controlling the access to content: freely accessible content; licence-based access (i.e., the access to a collection of resources is granted to a group of users); and credit-based access (i.e., the access to some resources requires the use of some credit). Participating teachers were provided with some credits and asked to get resources available for free or for credit. After having been exposed to credit-based access, teachers were asked to think about the use of digital credits to buy or access digital online resources.

Most of the teachers worked in schools that buy resources online. Seventy three percent of the teachers were willing to use a credit-based system as long as they did not have to pay for the credits themselves. Three out of the ten teachers were interested in being



paid for sharing their resources and more than half were interested in sharing resources in return for other people's resources.

Figure 31 shows how Romanian teachers feel about credit-based access to materials, if they could gain credits by rating other people's resources or providing feedback on them. Most indicated a strong interest in the credit-based system.



I don't see any benefits in rating content (for example with stars) or giving feedback on them

Figure 31: How do Romanian teachers feel about credit-based access to materials, if they could gain credits by rating other people's resources or providing feedback on them?



How do you feel about credit-based access to materials, if you could gain credits by uploading resources you had created to the platform?



- I would definitely use this approach to gain credits myself It would be the natural way: I give some, I get some.
- Interesting idea, but I would like to try to first to see what it involves
- I'm not sure if I would use this approach myself
- Sounds like too much work for me
- I wouldn't want to share my content with others

Figure 32: How do Romanian teachers feel about credit-based access to materials, if they could gain credits by uploading resources they had created to the platform?

In order for the teachers to gain credits, we proposed two ideas. First, teachers could gain credits by rating other people's resources or providing feedback to them. Second, teachers could gain credits by uploading to the platform resources they had created. As we see in figure 31, one third of the teachers thought option one was an interesting idea but were not ready to agree to it before learning more about how it would work. In the second case (gaining credits by uploading to the platform resources teachers had created, figure 32) most said they would definitely use this approach to gain credits with only in 9% indicating they would like to try it first.



5.8 Conclusion

In Romania, 10 teachers participated in the ASPECT project. Most of the teachers have many years of teaching experience. They spend a lot of time using a computer, on average, at least 2 hours a day and they use computers to prepare their lessons on a daily basis. They also use web materials on both a weekly and daily basis.

Romanian teachers preferred to create a lesson plan using normal web pages or taking parts of an IMS Common Cartridge package. Teachers preferred using SCORM packages for creating questionnaires and forums.

The majority of the Romanian teachers in the pilot thought that it is very important that the educational resources they find in the web are free. Regarding the two ways proposed for teachers to gain credits, teachers were open to both approaches, that they could gain credits by rating other people's resources or providing feedback to them and by uploading to the platform resources they had created.

Acknowledgements

The ASPECT project would like to thank all the Portuguese, Flemish, Lithuanian and Romanian teachers for their participation.