



Virtual Portal for Interaction and ICT Training for People with Disabilities

Pilot Findings

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Authors		George M. Milis (EuroCy), Karel Van Isacker, Bernard Van Isacker (PhoenixKM), Panayiotis Tsoris (Steficon), Andrew Burton (NTU), Vilma Butkute (Hiteco), Kosmas Petridis (Hypertech)	
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Version History table

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Acronyms / Vocabulary

ACRONYM	EXPLANATION
LO	Learning Object
ViPi	Virtual Portal for Interaction and ICT Training for People with Disabilities

1 Introduction

Following a successful pilot phase in the final year of the project, this report provides and analyses the consolidated findings and feedback from all ViPi project pilot sites in Belgium (P2), Cyprus (P6), Greece (P1), Lithuania (P4) and the UK (P5).

The document is organized as follows:

- Chapter 2 presents the ViPi outcomes that were piloted.
- Chapter 3 discusses the pilot evaluation methodology and the respective tools adopted in the ViPi pilot phase and the way these have been applied.
- Chapter 4 presents the raw pilot findings, followed by consolidated feedback and outcomes, as well as detailed analysis towards making useful conclusions.
- Chapter 5 provides the conclusions.

2 ViPi outcomes as piloted

In the course of the ViPi piloting, all outcomes of the project were evaluated by end-users and beneficiaries. A list of the ViPi outcomes is provided below, while the next sections provide a concise overview of the outcomes:

- (a) The ViPi integrated platform (including the social interaction facilities)
- (b) The ViPi e-Learning environment
- (c) The ViPi mobile application
- (d) The ViPi desktop educational games
- (e) The ViPi mobile educational games
- (f) The ViPi curriculum and training material
- (g) The ViPi handbook

2.1 ViPi integrated platform

2.1.1 Online platform

The online multilingual ViPi platform provides a number of core functionalities:

- Portal with semantically enabled LO repository
- Online community and networking
- Online learning environment

2.1.2 Mobile platform

The mobile platform encompasses:

- LO repository browsing
- LO feedback option
- General static page browsing

2.2 ViPi learning material

The ViPi learning material comprises the ViPi curriculum, the corresponding training material and the trainers' handbook, which has been assessed and piloted. The material was available in all local pilot languages (Dutch, English, Greek, Lithuanian), and in customised formats where necessary (easy reading and symbol supported; online course format with additional supporting training material).

2.3 ViPi gaming material

2.3.1 Desktop games

The following desktop games were pilot-assessed:

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- True/False ICT Quiz (in all languages)
- Yes/No ICT Quiz (English only)
- Escapology (in all languages)
- Rob the Mob (in all languages)
- Stay Safe (in all languages)
- Fly Swat (in all languages)

All of the above games were used during pilot sessions, in some cases with revised question sets, different from the main application release, where a pilot site required it.

2.3.2 Mobile games

The following mobile games from the Memobile game suite were pilot-assessed:

- Matching Pairs
- Starter Kit
- Press and... Action

3 Piloting methodology and adopted tools

The consortium decided to adopt a simple but efficient and effective methodology for the pilot phase. The starting point of the piloting was for all pilot sites to get an answer to the core question: “Can the ViPi ICT training methodology and outcomes improve ICT skills of people with disabilities?”

Having the above question as the main driver of all pilot activities, the five pilot studies took place between May and early December 2013, involving organizations and individuals across countries, across organizations and across different types of disabilities.

The pilot studies involved a considerable number of trainers/teachers (31) of whom the majority practice on a daily basis the teaching of people with disabilities, while few of them teach ICT and other subjects in public and private schools and would be interested to attract also persons with different types of disabilities. In addition, the study involved an even bigger number of students aged 16 plus (84), with several types of (combined) disabilities (e.g. learning difficulty with mobility, haptic and/or visual impairments). More specifically, the details of each pilot site are presented in Table 1 below.

Table 1: Pilots setup

Country	Period	Target group(s)	Training course units	Games	Local end-user organisation
BE	May-October 2013	People with learning difficulties, mixed with physical disabilities (18+), teachers, trainers	Unit 1 (and 2) Online and offline	Desktop and mobile games	Werkgroep Vorming & Aktie and individuals
CY	May-October 2013	People with vision and mobility impairment (16+), teachers, trainers.	Unit 2 and 3 Online and offline	Desktop and mobile games	School for the Blinds “Ayios Varnavas”, G.E English Center and individuals
GR	May-October 2013	People with mobility impairments (18+), teachers, trainers.	Unit 2 and 3 Online and offline	Desktop and mobile games	Disability Now (ΑΝΑΠΗΡΙΑ ΤΩΡΑ)
LT	May-November 2013	People with intellectual disabilities (18+), teachers, trainers.	Unit 1 Online and offline	Desktop and mobile games	Valakupiai Rehabilitation Centre
UK	May-October 2013	People with intellectual disabilities (16+) often in combination with complex physical or sensory impairment, teachers, trainers.	Customised version of unit 1 Online and offline	Desktop and mobile games	Older students and ex students from Oak Field School & Sports College.

As shown also in Table 1, the study focused on all ViPi outcomes, trying to determine if and how these outcomes could be combined to improve the ICT skills of the pilot participants. Because each pilot site had to deal with a variety of familiarity with ICT and background set of competences and skills (see the ones defined in the Competences and Skills Progress Radar (CASPER)), the local teams had to adapt also the training material they actually used in training sessions. Both online and offline material was used in pilot sessions, including the training content, the portal for accessing and discovering learning objects, the PC and mobile games, the e-learning environment, printed materials, printed labelling exercises etc.

The following tools have been adopted for reporting the pilot findings throughout the pilot phase:

- Competences and Skills Progress Radar (CASPER): The students were asked to rate their competency level against a pre-defined standard skill set. The rating was performed before engaging with the ViPi pilot sessions, as well as after the completion. The results were presented in a progress radar style.
- Observation checklist: This comprises a form where the researcher took guided notes about several types of observations made during the pilot sessions.
- Trainees' feedback form: This comprises a detailed feedback list and corresponding satisfaction rating on every single ViPi outcome.
- Trainers' observation table: This comprises feedback recording by the trainers undertaking the training of students during pilot sessions.
- Case studies: These capture real cases of end-users, beneficiaries and their supporters, in how they experienced and assessed ViPi material, and what added value there was if any. These are based on actual persons, and have been anonymised.

4 Pilot Findings

The following subsections present the pilot findings per pilot site while these are also consolidated and analysed in order to offer a project-wide complete view of the ViPi quantitative and qualitative achievements.

4.1 Pilot participants' profiles

The following participants' profiles have been recorded across all pilot sites, before and during the execution time of the pilot sessions.

4.1.1 Trainees

The pilots involved trainees from different age groups, where the largest part was composed of the youngest trainees (26%, 16-20 years old, [figure 1](#)) and the middle age group of 31-40 years old trainees (25%). The trainees of 21-30 years old composed 21% from the whole trainee group, while the age group of adults 41-50 years old composed 16% of the total and adults over 50 years old numbered 12% - the smallest of the age group in this pilot.

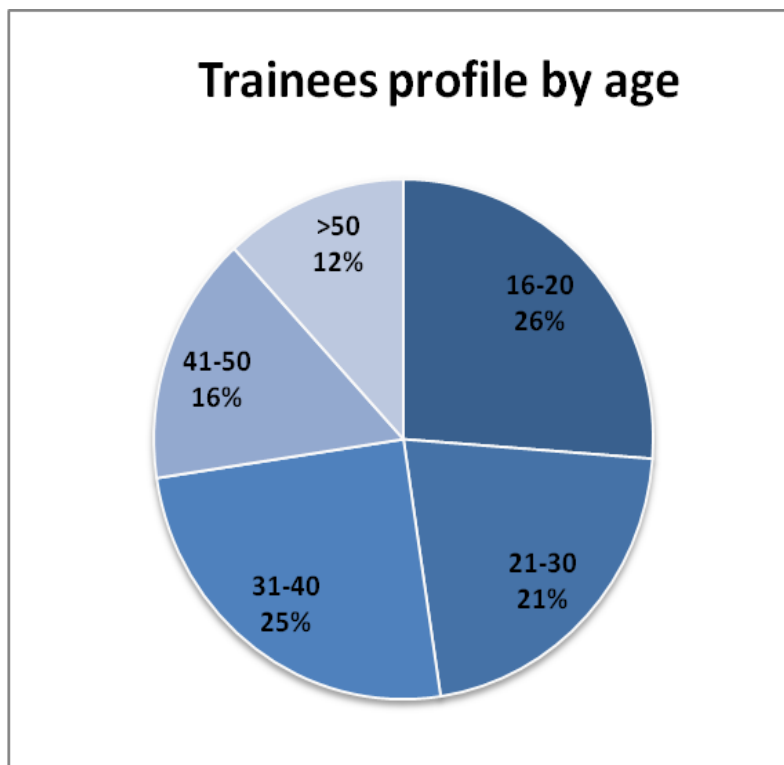


Figure 1: Trainees' age groups

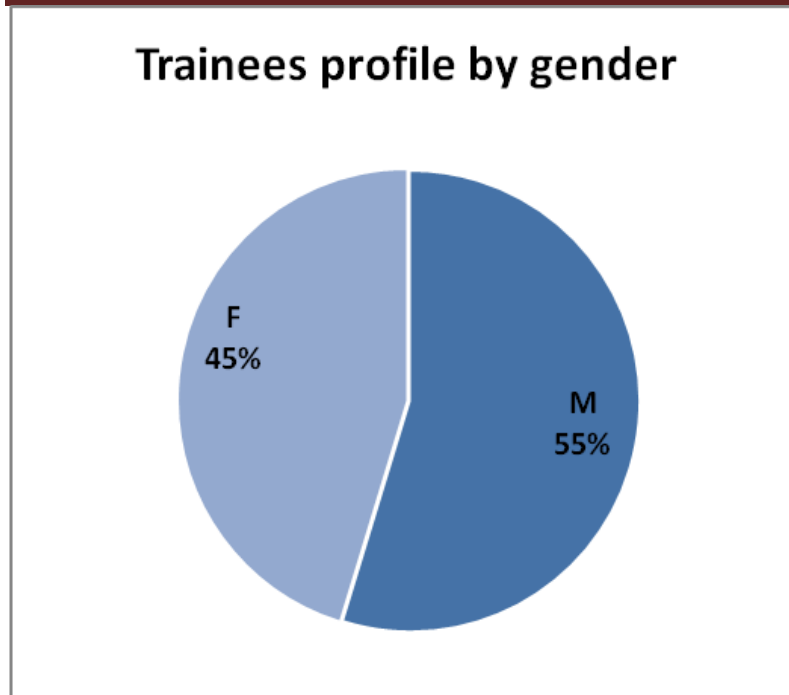


Figure 2: Trainees' gender

There was fairly equal participation between male and female trainees at respectively 45% and 55%, [figure 2](#).

The trainees indicated that their ICT skills before pilot training were mainly at beginner and intermediate level (respectively 45% and 23%, [figure 3](#)), while advanced level was selected by 32% of pilot participants. Those statistics are potentially influenced by the targeted group characteristics – spectrum of disabilities and their complexity, as well trainees' access to AT devices. 44% of the trainees indicated their use of assistive technologies ([figure 4](#)).

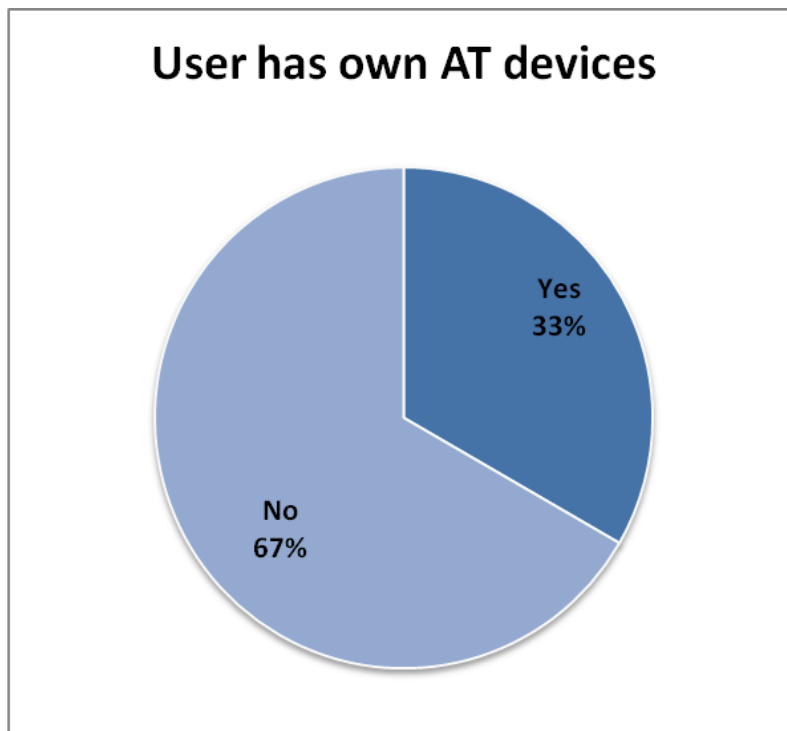


Figure 3: Trainees' ICT level

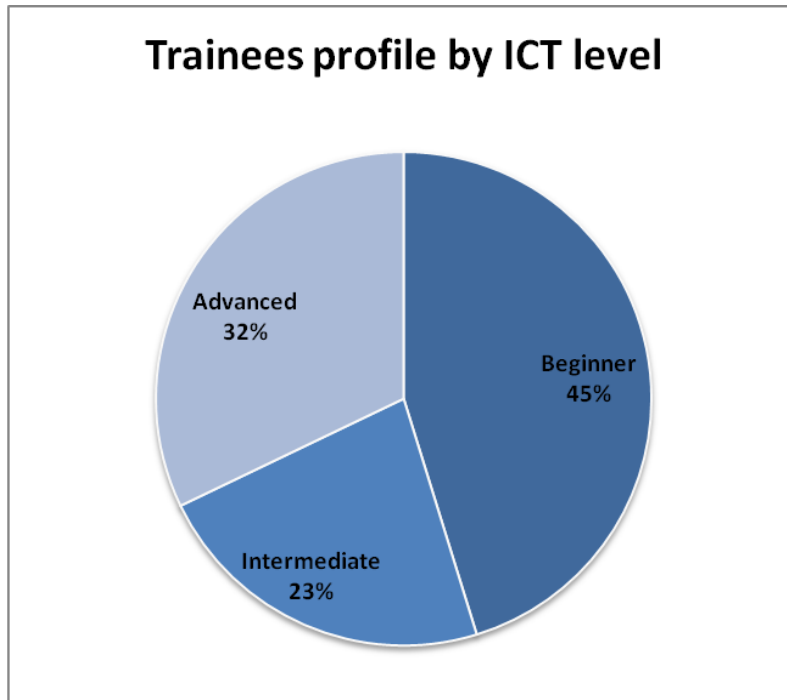


Figure 4: Trainees' with own AT device

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The pilot group of trainees consisted of an extensive spectrum of disabilities, in many cases combining more than one disability group (figure 5).

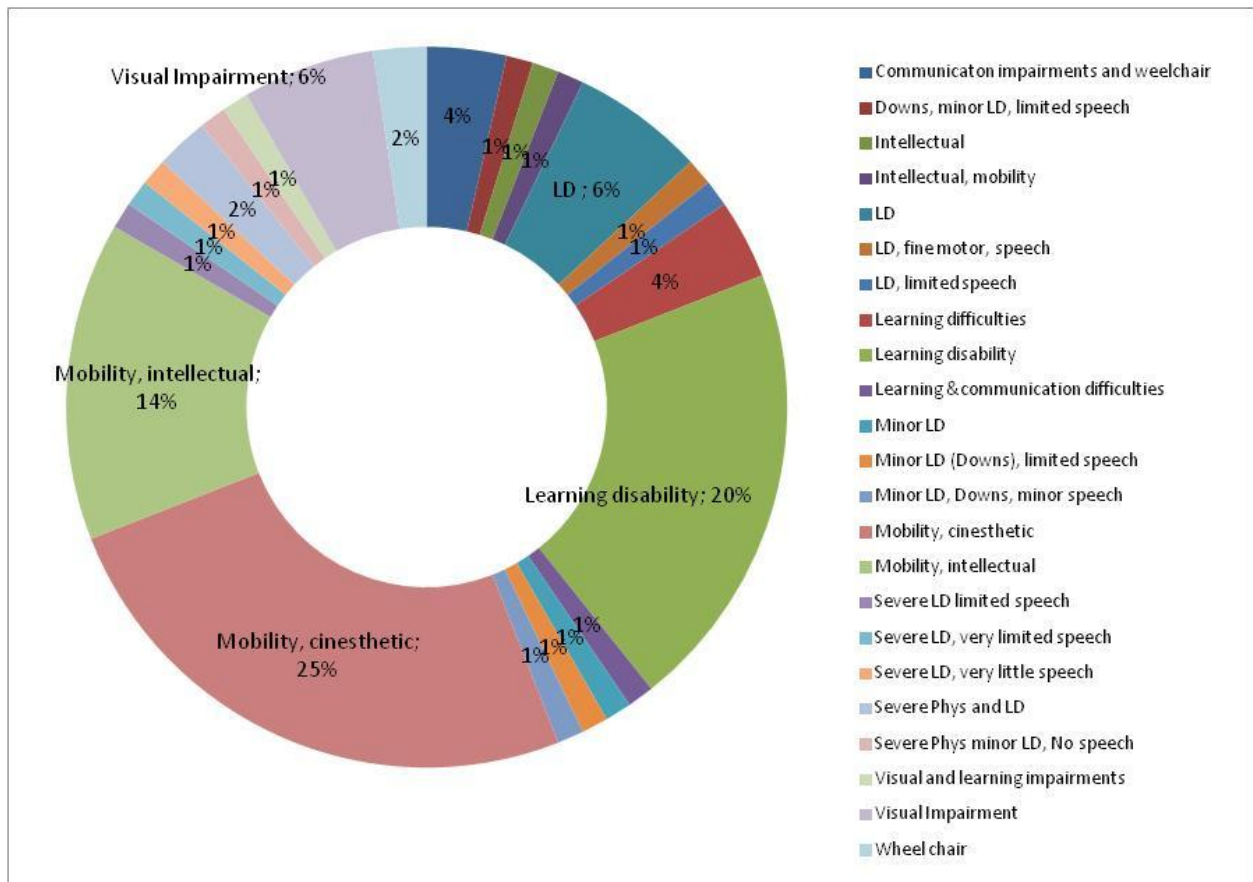


Figure 5: Disability spectrum of pilot group

The diagrams show that there were a variety of ages, disabilities and ICT skills' levels. The complexity of the target group necessitated a series of adjustments on content and the pedagogy used in all pilot sites.

The majority of the pilot trainee group consisted of people (students) with learning disabilities or disabilities in combination with learning disabilities.

The influence of complex characteristics was not the subject of the present pilot study and needs more precise methods in order to define the extent to which the characteristics have an influence in each particular case.

4.1.2 Trainers

The trainers involved in the pilots were from different age groups, where the biggest part consisted of the group of 31-40 year old, (52%, figure 6). The trainers of 20-30 years old and 51-62 years old represented the same portions (13%), while the age group of adults 41-50 years represented 22% of the trainers group.

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The female and male trainers were participating quite equally and represented respectively 55% and 45% (figure 7).

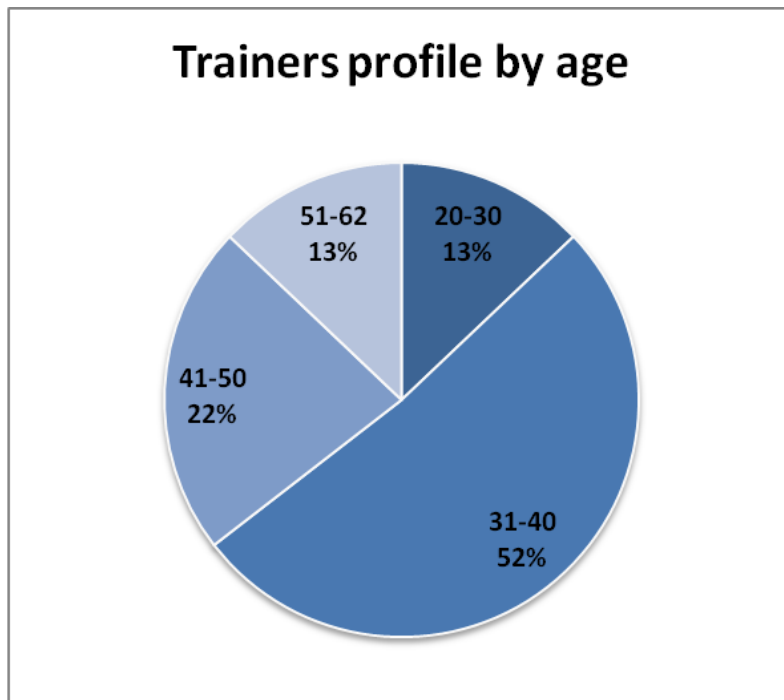


Figure 6: Trainers' age groups

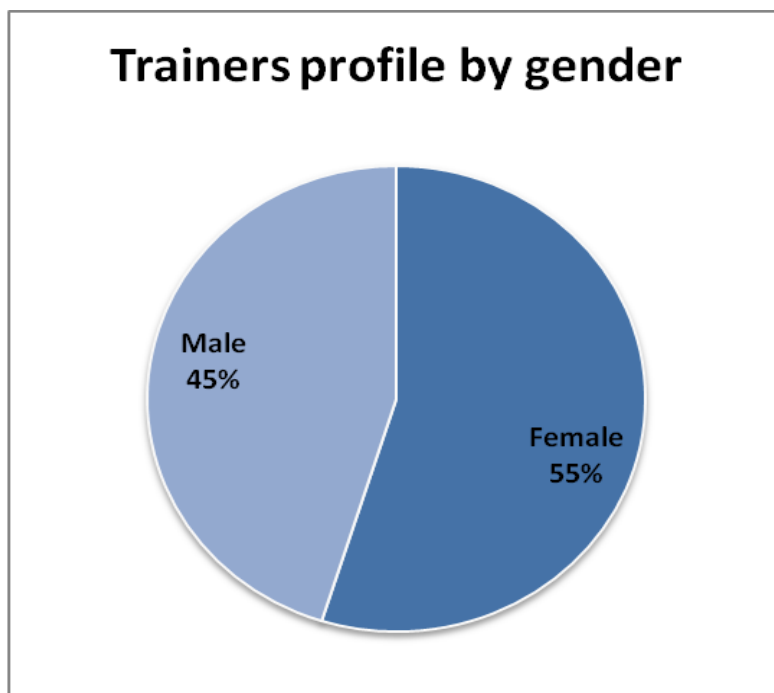


Figure 7: Trainers' profile by gender

The pilot trainers' ICT skills were mainly at an advanced level (79%) and intermediate level (14%), while teachers with beginner ICT skills represented only 7% (figure 8).

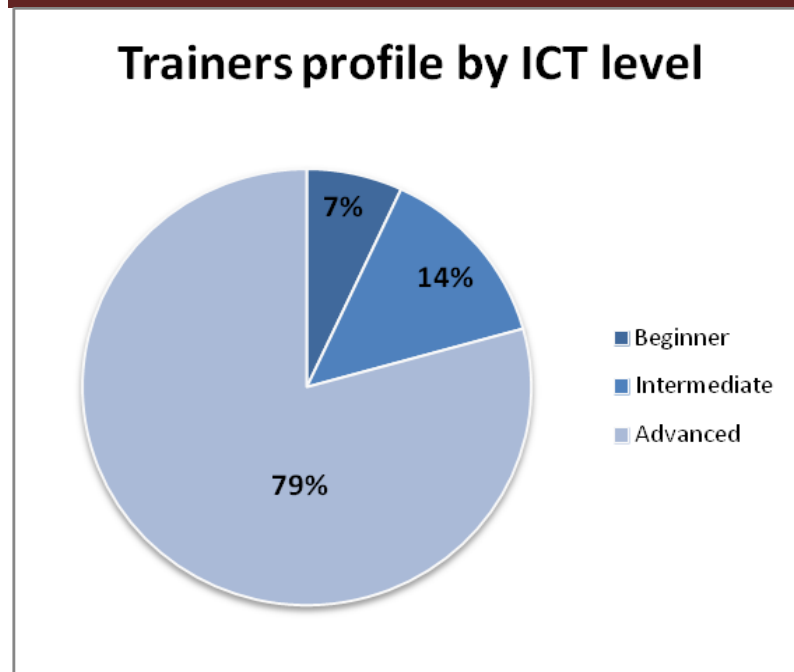


Figure 8: Trainers' ICT level

The trainers were specialised in working with a wide variety of disabilities (figure 9): physical disability (31%), mild learning difficulties (17%), mobility, learning disability (17%), intellectual disability (14%), and visual impairments (14%).

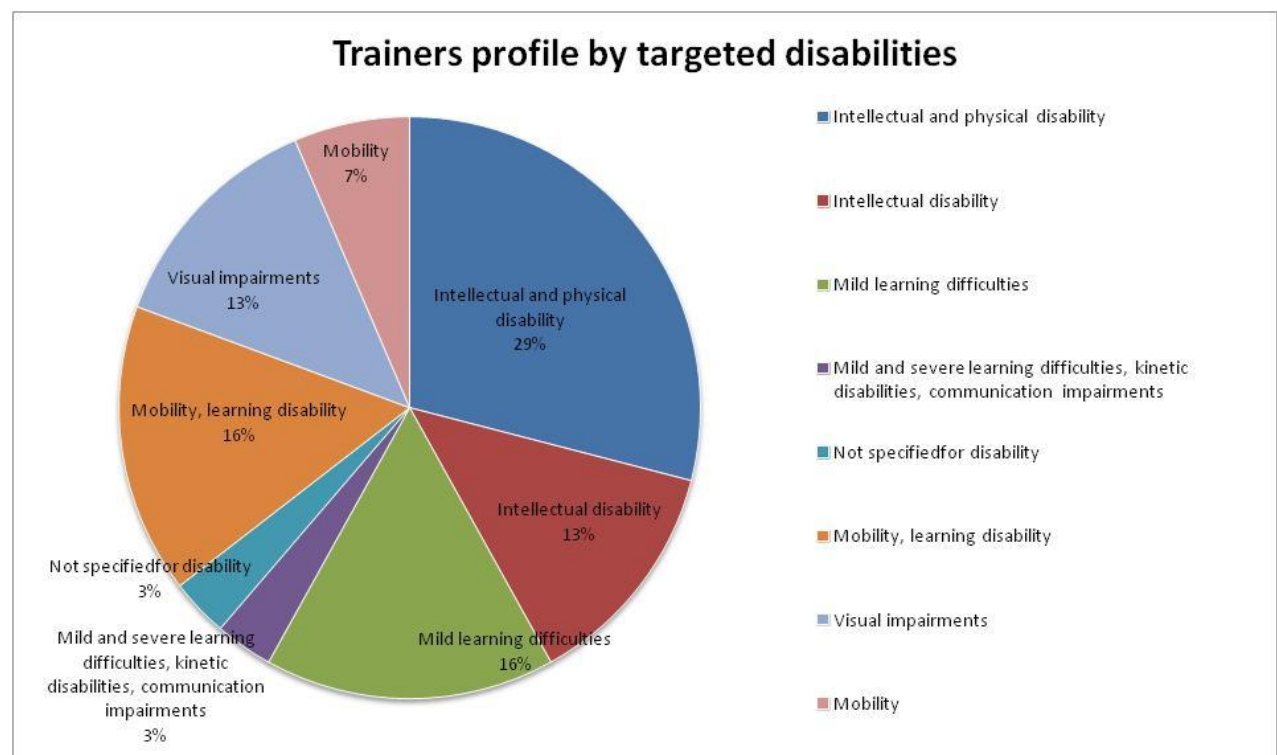


Figure 9: Trainers' specialisation to work with specific disability groups

The smallest proportion of trainers consisted of very specific disabilities (mild and severe LD, kinetic disabilities, and communication impairments – 3%) and those that did general ICT teaching, not specified to people with disabilities (3%).

4.2 Competences and Skills Progress Radars - Consolidated Findings

The radar diagrams per pilot site are presented in the following section. The scale of CASPER instrument measured progress level from 0 to 9 (0 being low and 9 being high).

4.2.1 Belgium

The results of Belgium pilot site indicate a positive progress in the biggest part of assessed competences, and in particular: *being safe, being responsible, self-esteem, enthusiasm, basic ICT skills, physical interaction with ICT and confidence in use of ICT* (figure 10).

The biggest progress took place with the *ICT related skills*. This is in line also with the general Belgian pilot findings, where end-users had displayed an eagerness to grasp ICT skills, and also successfully achieved this within the pilot time span.

The lowest progress was indicated in *numeracy, literacy, time keeping, flexibility, and communication & collaboration skills*.

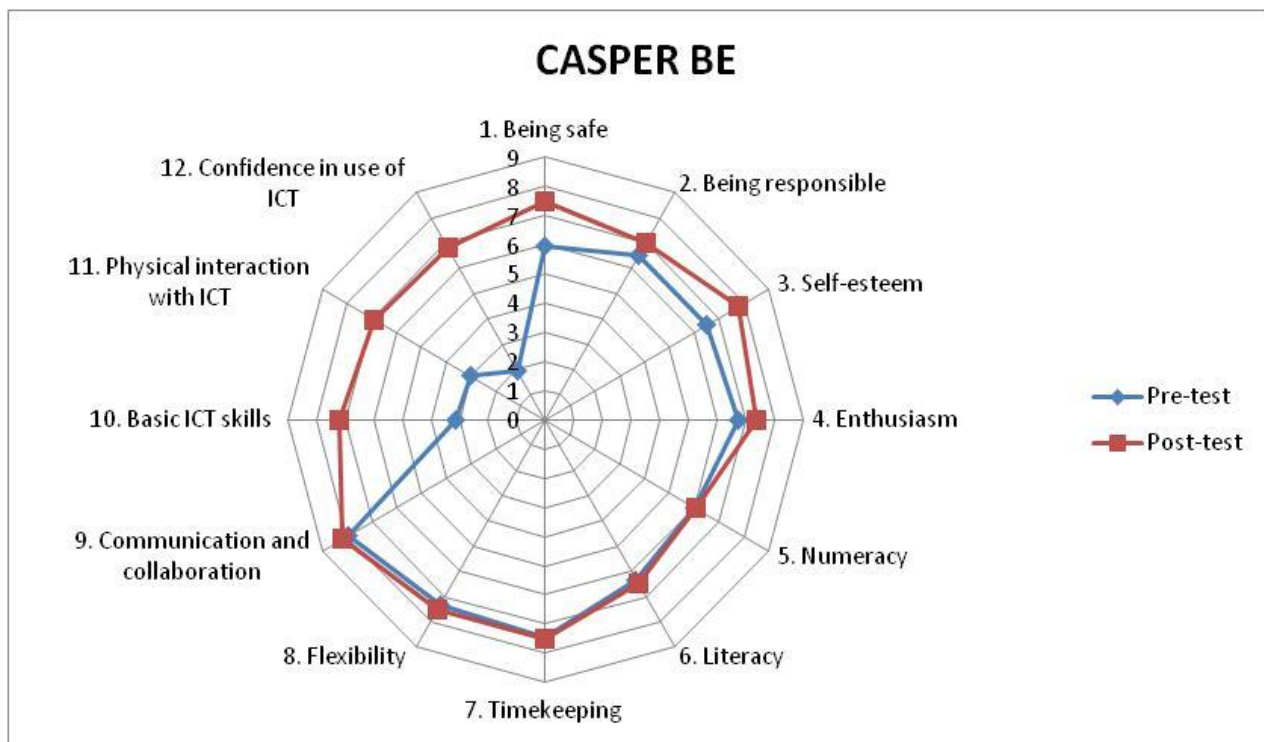


Figure 10: Competences and skills progress made by the BE site trainees

4.2.2 Cyprus

The results of Cyprus pilot site indicate a positive progress of the majority of the assessed competences, in particular *being safe, self-esteem, enthusiasm, timekeeping, flexibility, communication and collaboration, basic ICT skills, physical interaction with ICT and confidence in use of ICT* (figure 11).

The biggest progress was indicated in *enthusiasm*.

The lowest progress was in *being responsible, numeracy, literacy and time keeping*.

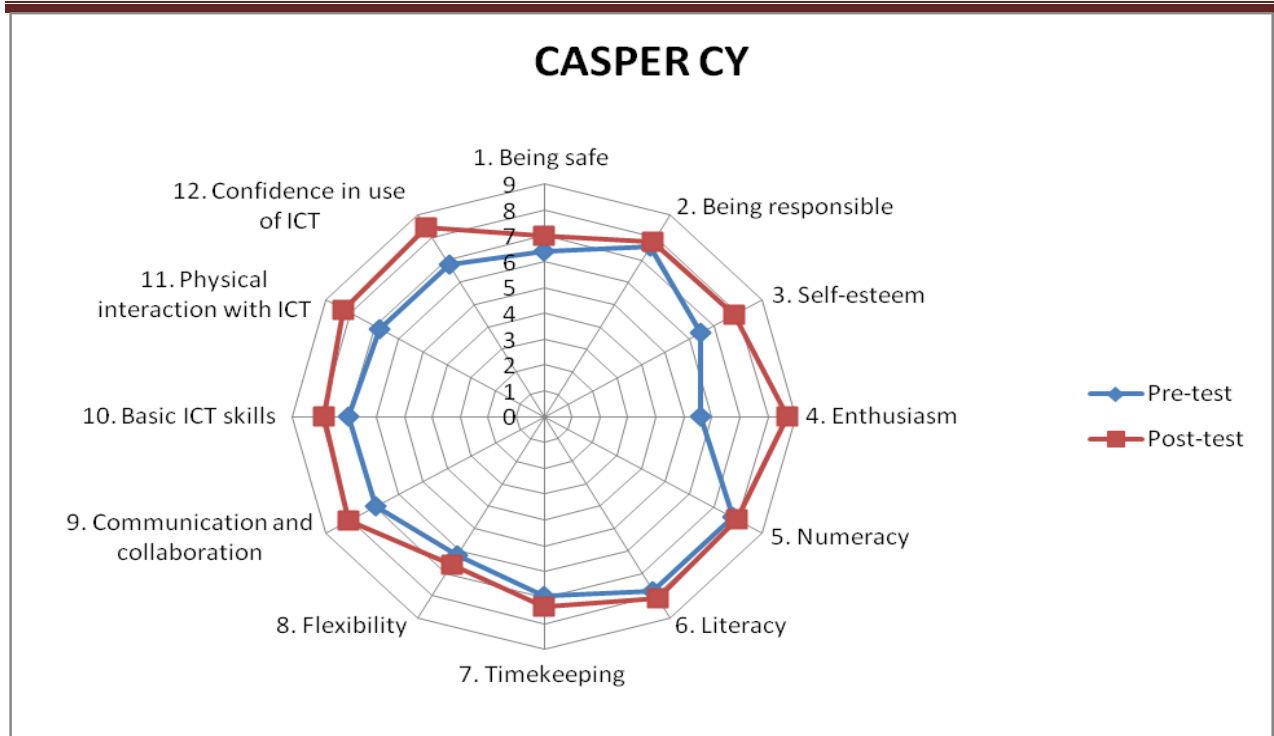


Figure 11: Competences and skills progress made by the CY site trainees

4.2.3 Greece

The results of Greece pilot site indicate a positive progress on more than half of the assessed competences, in particular *being safe*, *being responsible*, *enthusiasm*, *physical interaction with ICT* and *confidence in use of ICT* (figure 12).

The biggest progress was indicated in *enthusiasm*.

The lowest progress was in *flexibility*, *communication and collaboration* skills.

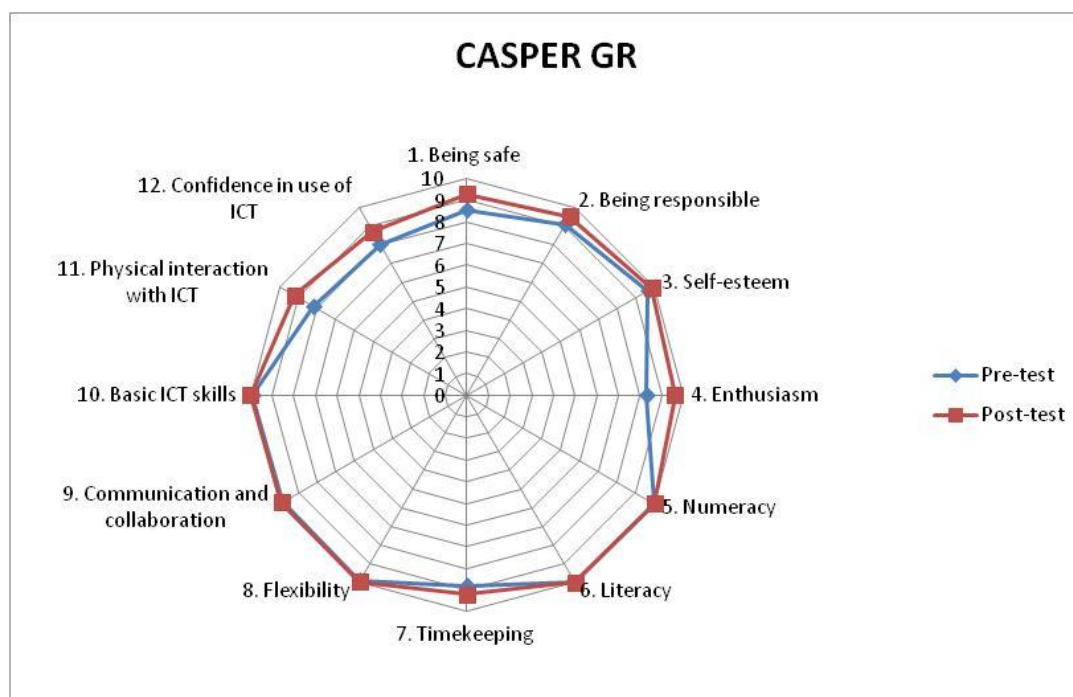


Figure 12: Competences and skills progress made by the GR site trainees

4.2.4 Lithuania

The results of the Lithuanian pilot site indicate a positive progress of the majority of the assessed competences, in particular for *self-esteem*, *enthusiasm*, *time keeping*, *flexibility*, *communication and collaboration*, *basic ICT skills*, *physical interaction with ICT* and *confidence in use of ICT* (figure 13).

The biggest progress indicated was in *enthusiasm* and *self-esteem skills*.

The lowest progress indicated was in *being safe*, *being responsible* and *numeracy*.

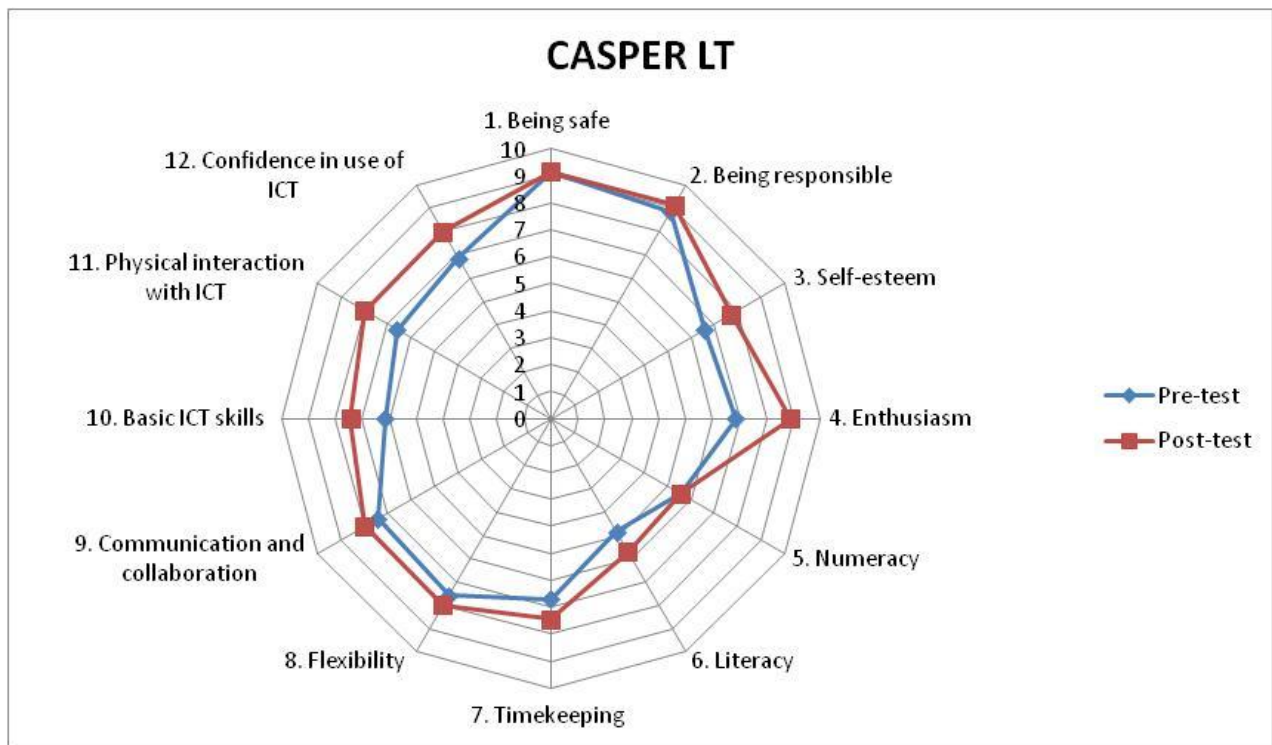


Figure 13: Competences and skills progress made by the LT site trainees

4.2.5 United Kingdom

The results of the United Kingdom pilot site indicate positive progress of the majority of the assessed competences, in particular *being safe*, *being responsible*, *self-esteem*, *enthusiasm*, *numeracy*, *literacy*, *flexibility*, *basic ICT skills*, *physical interaction with ICT* and *confidence in use of ICT* (figure 14).

The biggest progress indicated was in *flexibility* skills.

The lowest progress indicated was in *time keeping* skills.

It should be noted that the CASPER was simplified due to the nature of the group by using ratings from 1 to 5 in the UK pilot, so 5 was the maximum here. Also many of the participants were unable to rate themselves due to their level of understanding and/or self-awareness.

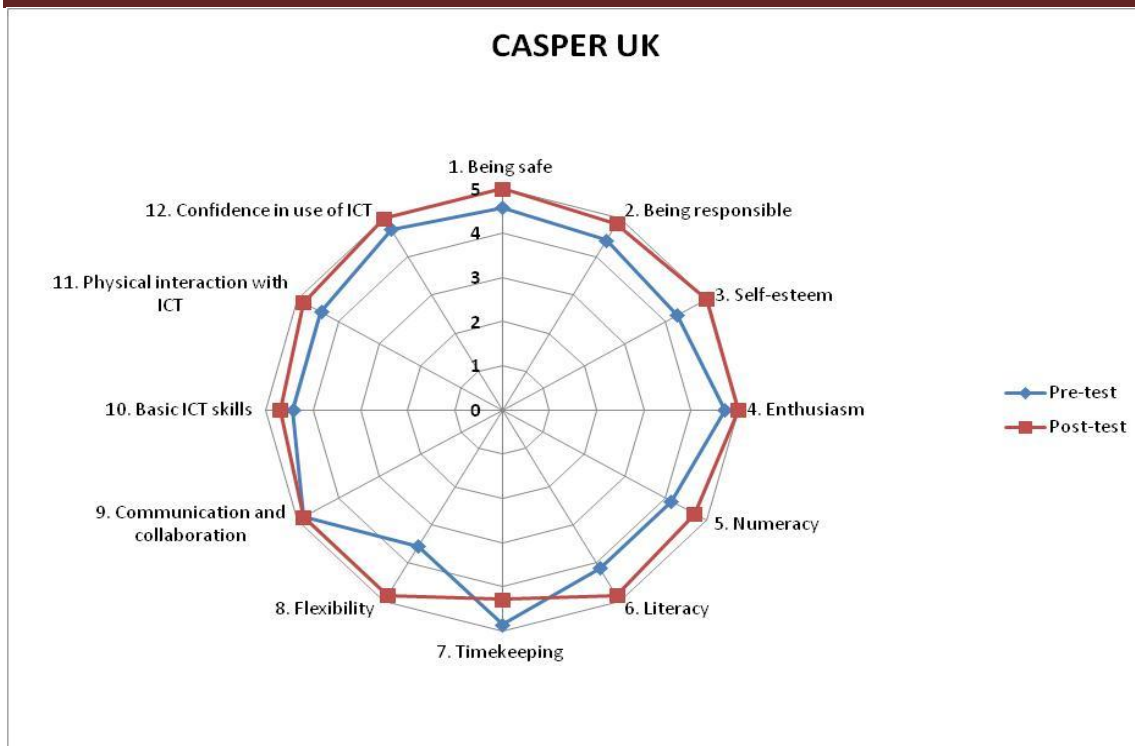


Figure 14: Competences and skills progress made by the UK site trainees

4.2.6 Consolidated findings

The pilot sites analysis shows progress in all twelve observed competences and skills categories. However there are significant variations among the countries and its level of progress: the consolidated diagram (figure 15) shows the pilot sites average alterations of separate competence and skills ranging from 0,06 to 4,06 units (on a scale from 0 to 9). The consolidated diagram represents the average values of progress in each competence by the different pilot country together with the average of the whole pilot group progress.

The analysis defined the biggest progress in competences related to ICT - it was effective at all pedagogical perspectives: *Confidence in use of ICT (emotional dimension)*, *physical interaction with ICT (operational dimension)* and *basic ICT skills (cognitive dimension)*. It proves the pedagogical efficiency of ViPi deliverables in teaching basic ICT skills to people with disabilities.

Significant progress was also demonstrated in the consolidated results in two social competences – *self-esteem and enthusiasm*. Those results match with the reported effects of gaming, interaction with the content or learning by doing strategies at all pilot sites.

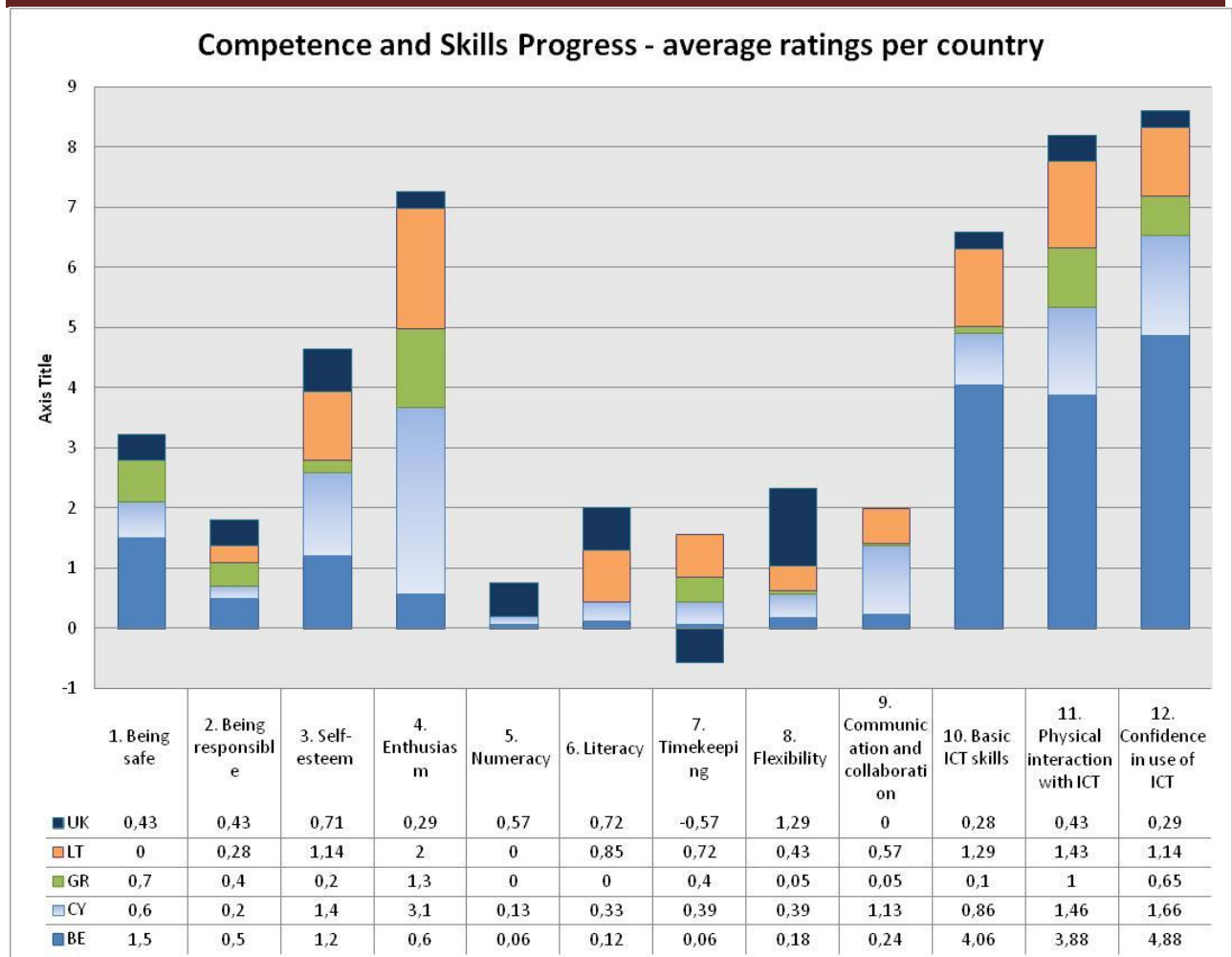


Figure 15: Consolidated Competences and Skills Progress from all pilot sites

4.3 Observational checklists – Consolidated Findings

The consolidated feedback of the observation checklist with input from the trainers and trainees, was based on a questionnaire that asked about each of the ViPi deliverable characteristics, assessing them on a scale from 1 to 5: 1: Strongly Disagree ; 2: Disagree ; 3: Neutral ; 4: Agree ; 5: Strongly Agree.

The figures in the following sections present the collected feedback per ViPi piloted outcome, where a vertical axis represents the assessment ratings from 1 to 5, and a horizontal axis the characteristics of each piloted outcome.

The diagrams represent the graphical visualisation only for the available data. Because of the varied pilot group, in some cases the trainers decided which questions the students were able to complete, based on considerations of their ability to rate, or understand what was being rated, as well as on what ViPi outcomes they had used. It is not appropriate to ask a long list of questions that a student does not understand, a process which would make them uncomfortable and serve no academic purpose.

4.3.1 ViPi online portal functionalities

The ViPi online portal overall evaluation mark is 3.8/5. The diagram below shows the ratings for separate online portal functionalities assessed among the pilot countries.

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The best evaluations received were for the main public functions available for users – logging in to the portal, browsing public sections of portal and browsing through LOs, as well as the creation and submission of LOs.

Editing of the profile was identified as being more complicated.

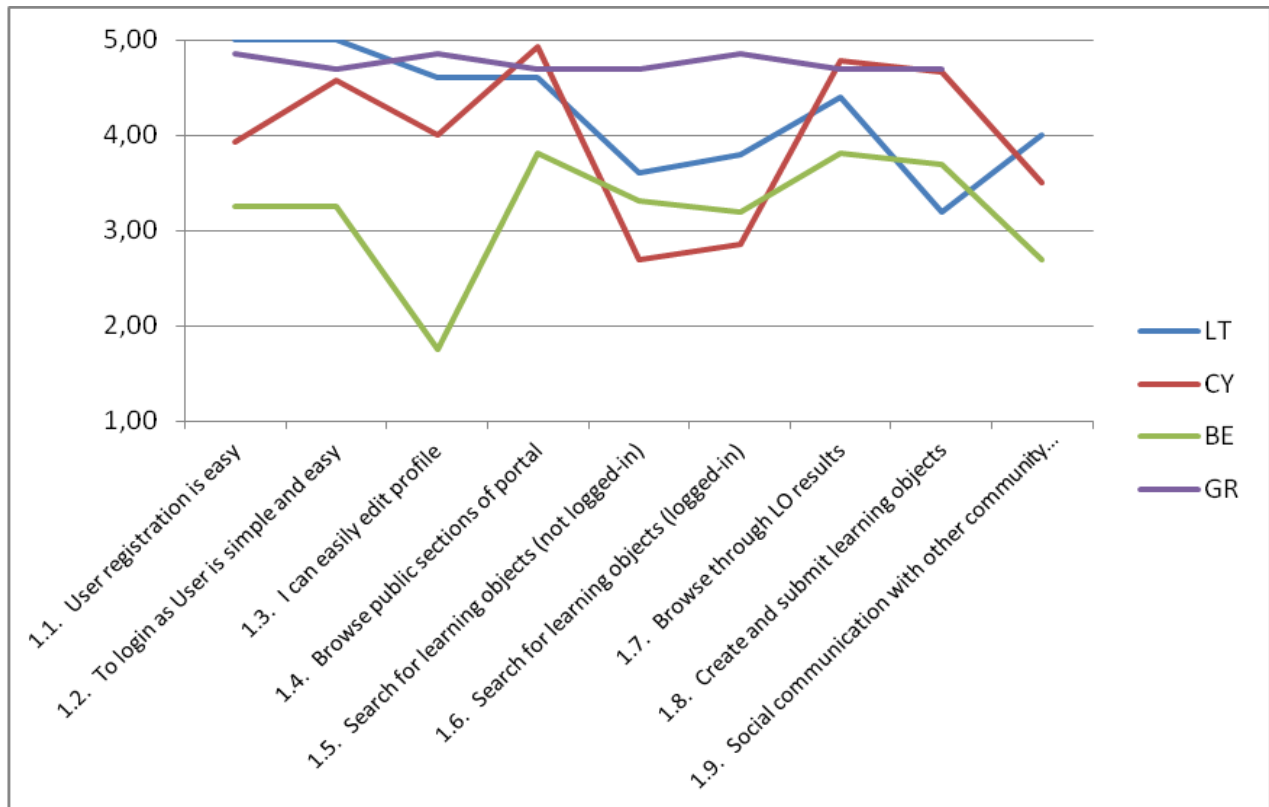


Figure 16: Consolidated feedback on ViPi online portal

This suggests that the ViPi portal is adapted to the needs of the targeted users and is fully accessible to targeted group to use for its main purposes – navigation through the portal, download and upload. The search functions (1.5 and 1.6 characteristics in the diagram, figure 14) were considered somewhat complicated.

4.3.2 ViPi mobile portal functionalities

The ViPi mobile portal overall evaluation mark is 3.1/5. The diagram below shows values of separate mobile portal functions assessed among the pilot countries.

The best evaluations received related to the main public functions available for users, and the browsing through of general ViPi content (except CY and UK, who didn't test the function because of the trainees' complex disabilities).

The less useful functionalities according to the users were editing of settings and quick search functions.

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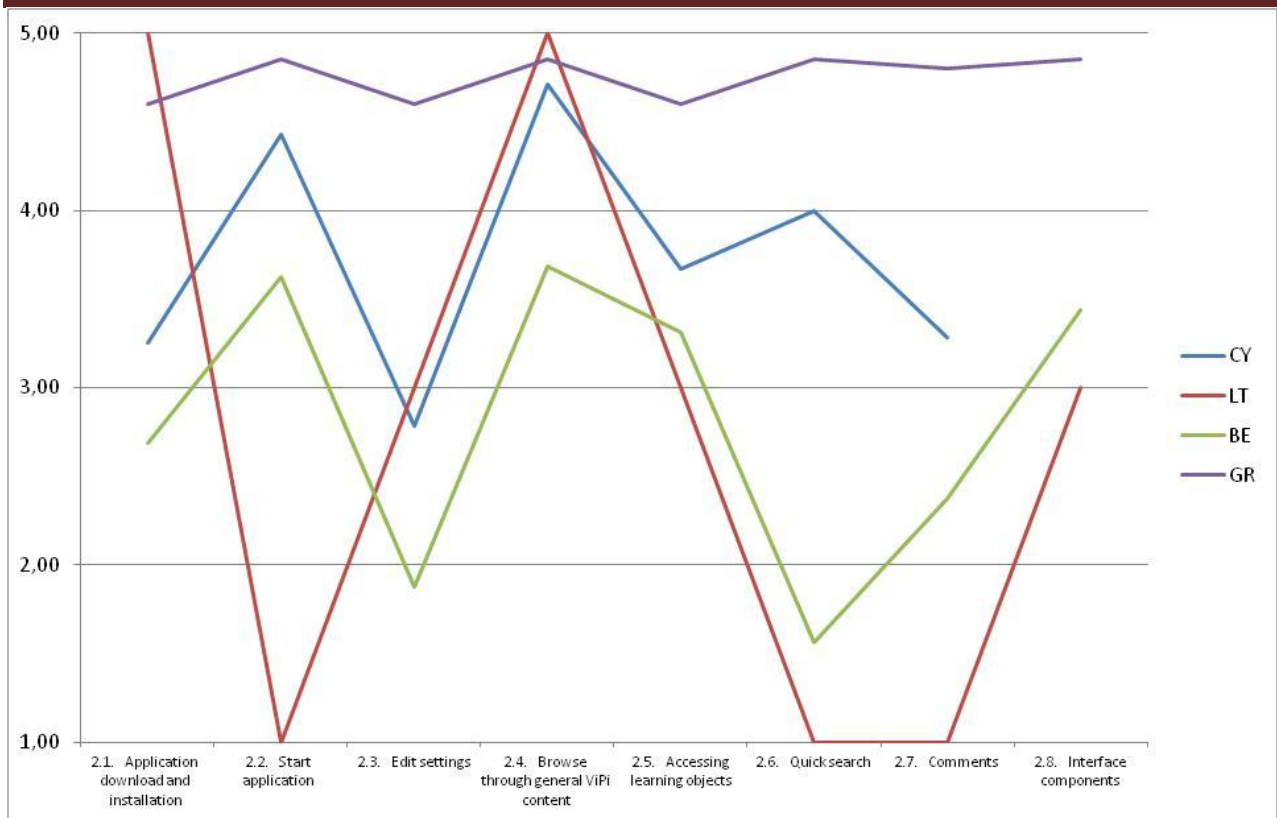


Figure 17: Consolidated feedback on ViPi mobile portal

The feedback on the mobile portal shows the users' attraction and positive attitude towards mobile technologies to access educational resources. The feedback also indicates that besides the users' interest, they also expect the mobile interface functions to be as simple as possible.

4.3.3 ViPi desktop game functionalities

The ViPi desktop games' overall evaluation mark is 2.9/5 for technical settings and 4.1/5 for game play functions. The diagram below shows values of separate desktop game play functions assessed among the pilot countries.

According to the summary data, very good evaluations were received for the most graphically structured and audio supported games: "True and False" and "Yes/No" game. The "Yes/No" game was only played in the UK.

"Stay Safe" game was evaluated lower, mainly because of the literacy skills that were needed outside of the UK (inbuilt TTS in the XNA system did not function correctly with the non-english languages).

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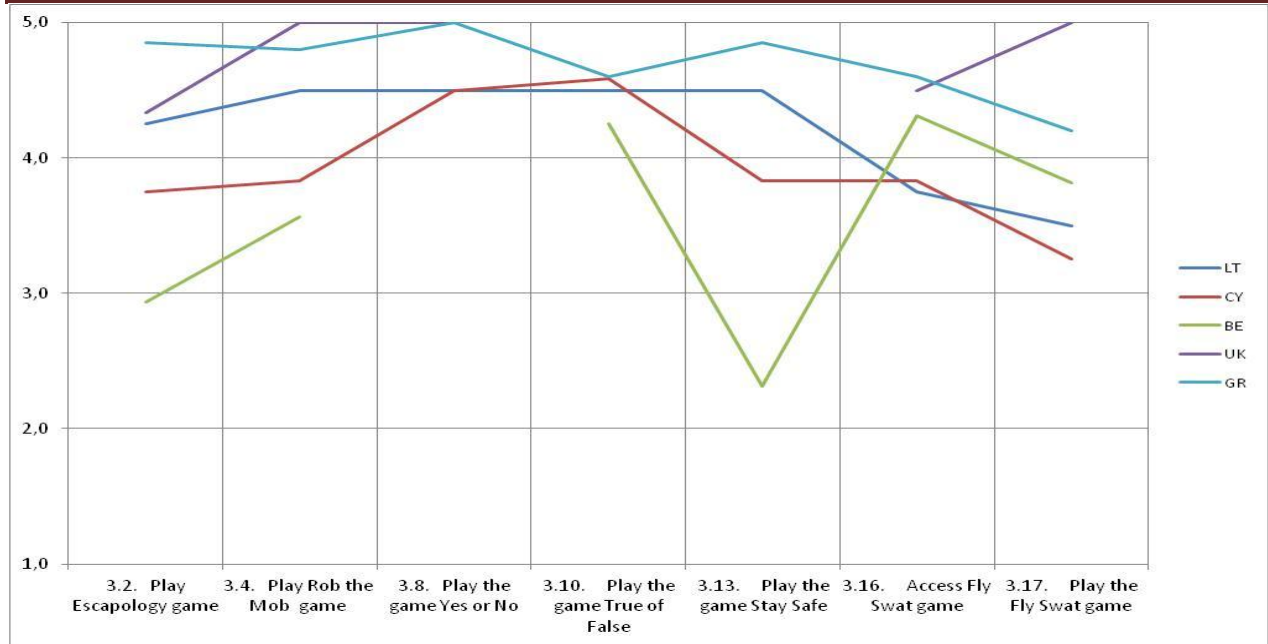


Figure 18: Consolidated feedback on ViPi Desktop Games

4.3.4 ViPi mobile game functionalities

The ViPi mobile games' overall evaluation mark is 4.6/5. The diagram below shows the values of the separate mobile portal functions assessed among the pilot countries.

The attractive game graphics and quality game mechanisms were positively evaluated. The ease to understand how to play certain games was particularly appreciated.

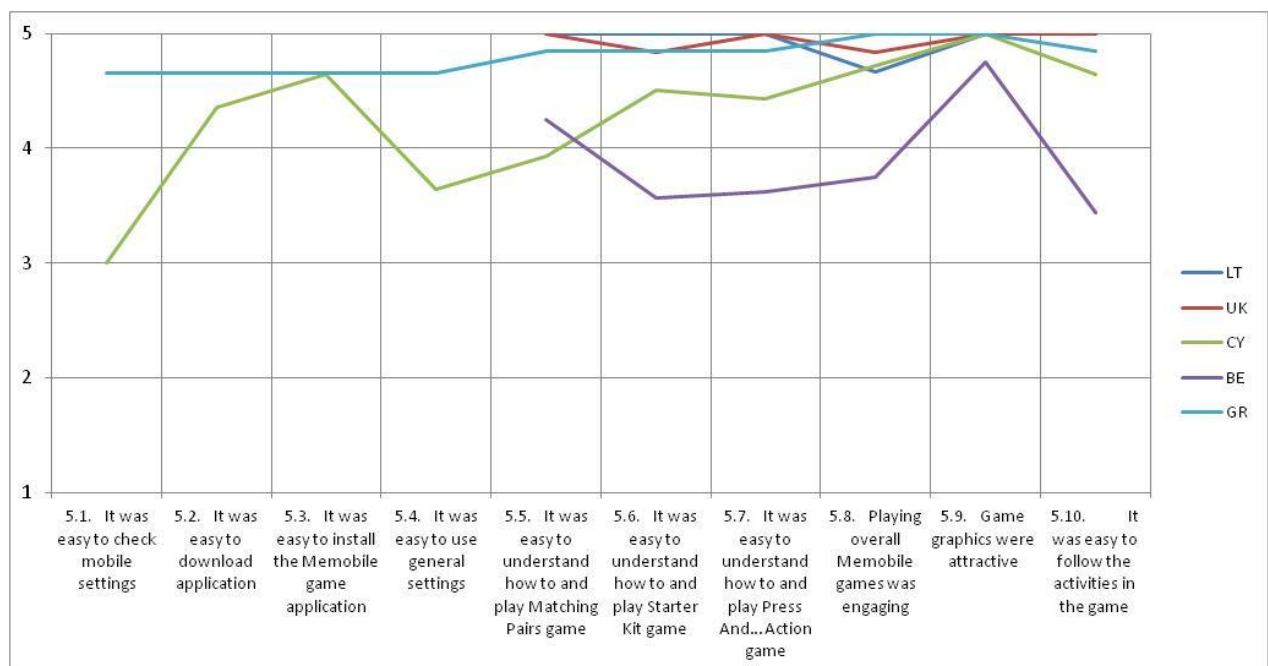


Figure 19: Consolidated feedback on ViPi Mobile Games

4.3.5 ViPi curriculum, training content and handbook

The ViPi curriculum, training content and handbook's overall evaluation mark is 4.5/5. The diagram below shows values of separate characteristics of this set assessed among the pilot countries.

The data analysis shows very high ratings in all assessed sections. It proves that the educational material achieved a high quality, and was functional in its usage by both the trainer and trainee.

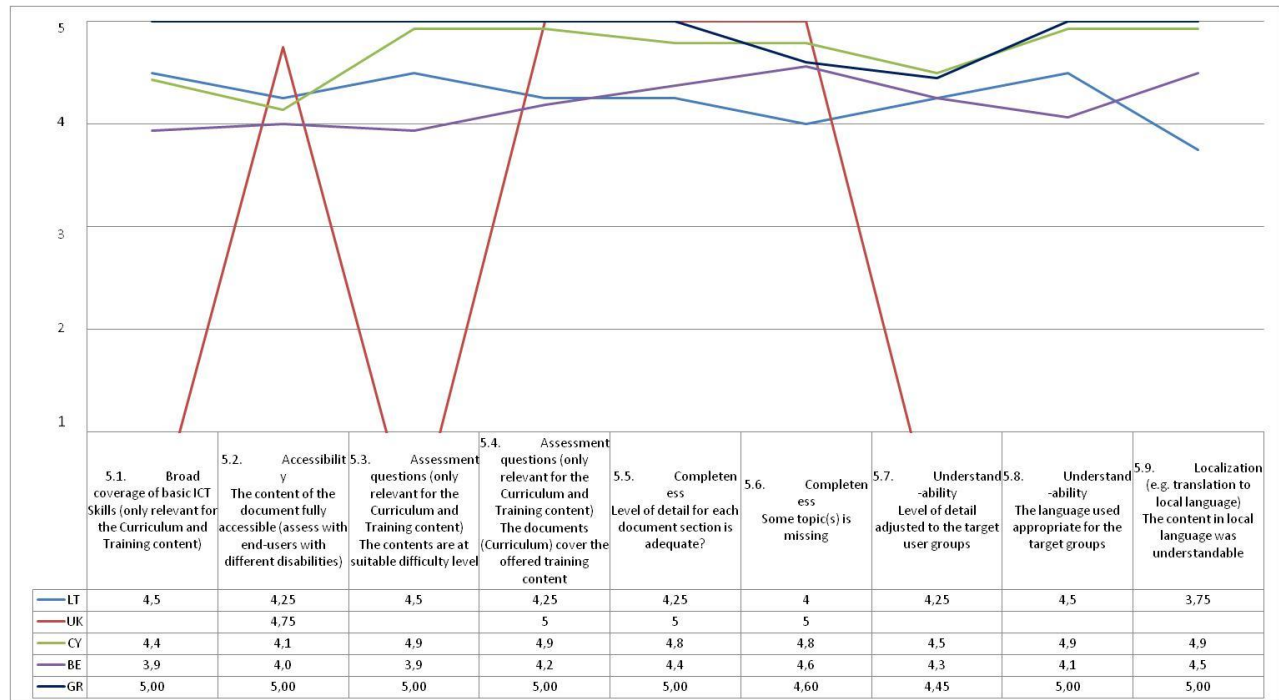


Figure 20: Consolidated feedback on ViPi curriculum, training content and handbook

4.4 Trainees feedback on the training sessions - Consolidated Findings

The pilot sites used a Likert scale to collect feedback from the trainees. Using simplified questions, the trainees' opinion in relations to the use of ViPi outputs could be identified.

4.4.1 Pilot site: Belgium

The pilot site in Belgium involved a wide range of disabilities, with a common denominator: poor to non-existent ICT skills. During the piloting, almost all participants gained the necessary skills to use ICT independently, and have improved their competence in using a wide variety of software considerably.

Both the modular teaching approach whereby first the skills of every participant were assessed, and then training took place in group, and the peer supporting that was established became important elements in the success of the training sessions. In addition, the training itself was done via practical exercises, and completed every time with games. These were done as a group (the games were projected onto a big screen, together with audio support where available), so that everyone was able to learn from them. Afterwards, they were invited to also use the games at home. Especially the "True/False" and Memobile games scored very highly here as they were easy to use (simple questions, answers and clarifications).

Below is the consolidated feedback.

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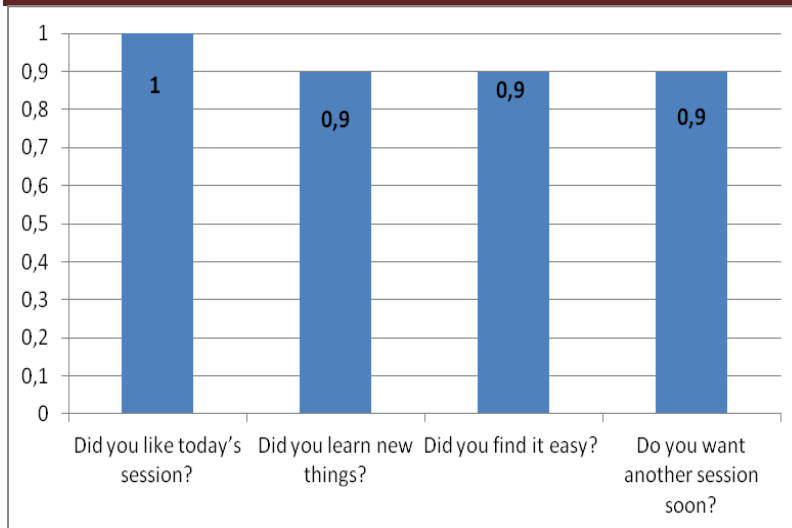


Figure 21: Consolidated feedback from BE on ViPi pilot sessions

The trainees' feedback focused on a whole range of skills that were learned. Below provides a summary of the comments received:

- **Using:** the usage of computer/laptop and the tablet, the keyboard, internet, games. For many, this was the first experience ever in using any such ICT related devices, as well as software.
- **Learning:** Most users acquired the following competences during the piloting period: making letter or document, creating and sending email, looking for information online by using the internet, and playing games. The most important element that was seen repeatedly was that the teaching and learning took place at the trainees' own speed
- **Playing:** both with the desktop and the mobile games.

4.4.2 Pilot site: Cyprus

Considering the complexity of the feedback that needed to be collected, it was not possible to ask all questions during the pilot sessions. Therefore, the figure below shows an overall mark based on the feedback received by trainers' observations. Some more detailed feedback by trainers suggested that only mobile games and few of the PC games (True/False, Rob the Mob) were actually easy to be understood and used by trainees. However, trainees liked the fact that they were participating in research and they would not object to follow-up with the sessions. The trainees' favourite material was first the mobile games and then the PC games. They were quite happy to work also with searching LOs and taking online courses, however, they did prefer the physical lessons.

The overall feedback from the trainees about the sessions was positive, the question "if you like today's session" was evaluated 100% positive.

4.4.3 Pilot site: Greece

All trainees gave a similar feedback because the advanced course material was prepared and delivered to them after discussion with them and collecting the type of material they would like to learn during the training sessions. We note here that the Greek trainees were all of advanced ICT level knowledge, as the user group was selected by Disability Now, who produce a website/publication for, about and by disabled people.

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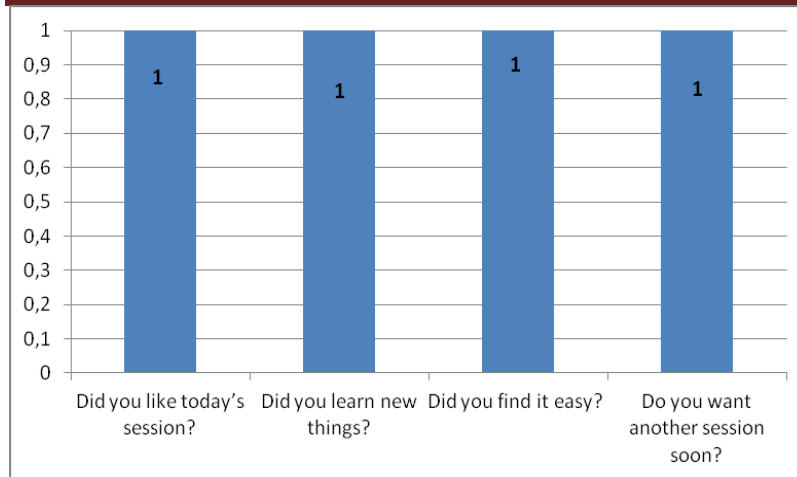


Figure 22: Consolidated feedback from GR on ViPi pilot sessions

Trainees' feedback on the best thing learned:

- **Used** the games
- **Learned** video subtitling, learned to create a blog site and learned basics of video editing.

4.4.4 Pilot site: Lithuania

The figure below shows an overall mark based on the feedback received by trainers' observations. Pilot sessions with trainees proved that they need a lot of assistance before starting to use educational material independently. All functions of the web and mobile portal were not always used and the game StaySafe was considered too complex to be used by most trainees.

However, trainees liked very much the physical lessons and were attending eagerly. Students favoured different games: Escapology game, Rob the Mob and Mobile games. Some trainees' liked to use the touch screen on the tablet and laptop computer instead of the desktop, while others wanted to challenge themselves with more mainstream PC input technology. They appreciated the different levels in the games and the final score was seen as an encouragement to continue the game.

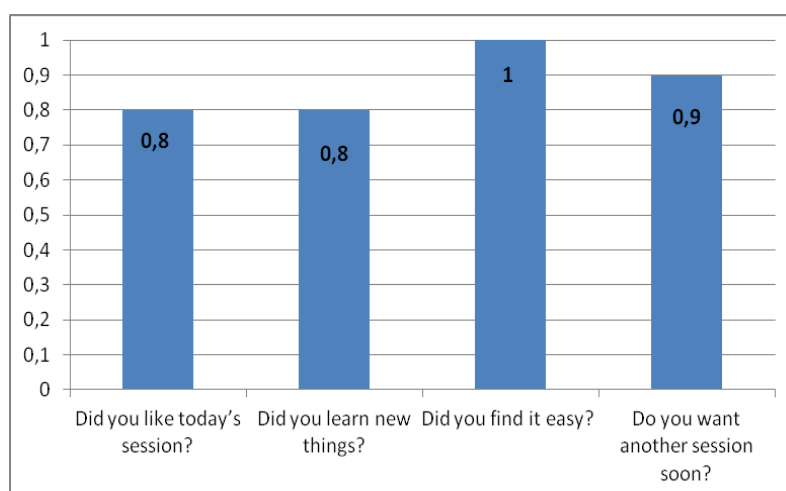


Figure 23: Consolidated feedback from LT on ViPi pilot sessions

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Trainees' feedback on the best thing learned:

In the most cases the students reply was one of agreement and confirmation that they liked or were interested in the content.

To the question, what they liked the most, in many cases they liked it when they were challenged to try something new – for example, a new button, a touch screen, or other computer part or function:

- "I liked the test", "I **tried** touchpad",
- "I liked to play games, I **learned** how to use touch screen", "I liked.. I **know how** to switch on computer, monitor and use mouse; I **learned** where is the button "enter "
- "I liked games because of touch screen".

At the same time students were replying that those activities are not easy for them:

- Not easy – couldn't remember how to do task in game
- Not easy because of language barrier (not native Lithuanian)
- couldn't understand everything, but very interesting

4.4.5 Pilot site: UK

Due to the complex needs of and the wide variation in abilities of the participants at the UK pilot site, pilot training was undertaken on a one-to-one basis. In this way, the ability and needs of each participant could be assessed, and the training tailored to work at an appropriate level using appropriate tools and assistive technologies for each participant. Training strategies could also then be adapted on an ad-hoc basis to increase student engagement. At each session there were two researchers present so that one could act as the trainer, delivering the course materials, and the other was free to record observations on materials used, timings, assistance given, problems encountered, levels of engagement, appropriateness of materials and user comments. These observations would be the most important means of feedback from the UK pilot study as in many cases the ability of participants to rate their own skills and the effectiveness of materials would be low. Further feedback was sought only when deemed appropriate by the researchers using a differentiated CASPER and Likert scales.

For the benefit of the user group in this study, assistance was provided in selecting a skill level by redefining the questions in more understandable language, and by using smiley faces to represent 5 different scores. The list below shows the rewording of the key skills as presented to the participants.

Rewording the Key Skill ratings questions for ease of understanding

1. Being safe → How safe do you feel using a computer?
2. Being responsible → How good are you at making the right decisions?
3. Self-esteem → How do you feel about yourself?
4. Enthusiasm → How much do you like using the computer?
5. Numeracy → How good are you with numbers?
6. Literacy → How good are you at reading and writing?
7. Timekeeping → How good are you at being on-time?
8. Flexibility → How easy do you find it to stop doing one thing and start doing something else?
9. Communication and collaboration → How well do you work with other people?
10. Basic ICT skills → How much do you know about using computers?
11. Physical interaction with ICT → How good are you at using [your input technology]?
12. Confidence in use of ICT → How good are you at using computers?

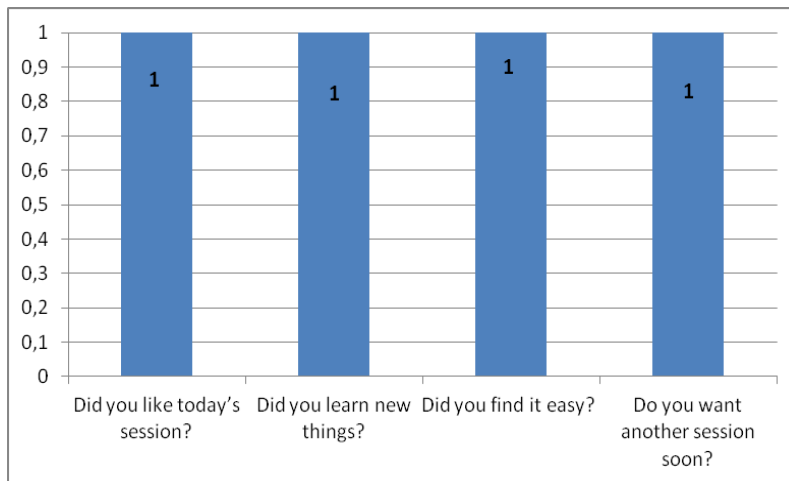


Figure 24: Consolidated feedback from UK on ViPi pilot sessions

Trainees' feedback on the best thing learned:

- ✓ the quiz and the work
- ✓ fly swat
- ✓ looking at my school website
- ✓ starter kit
- ✓ good games computer work
- ✓ liked the smiley faces
- ✓ learning new shortcut keys
- ✓ talking about safety on the internet
- ✓ YouTube, tablet games
- ✓ internet liked the mobile games
- ✓ quiz
- ✓ games
- ✓ liked learning
- ✓ Quiz, on/off button game

4.4.6 Consolidated Pilot Findings

The consolidated pilot findings show the overall positive feedback that was received in all pilot sites. This is partly due to the fact that training material was customised to the needs of the trainees involved.

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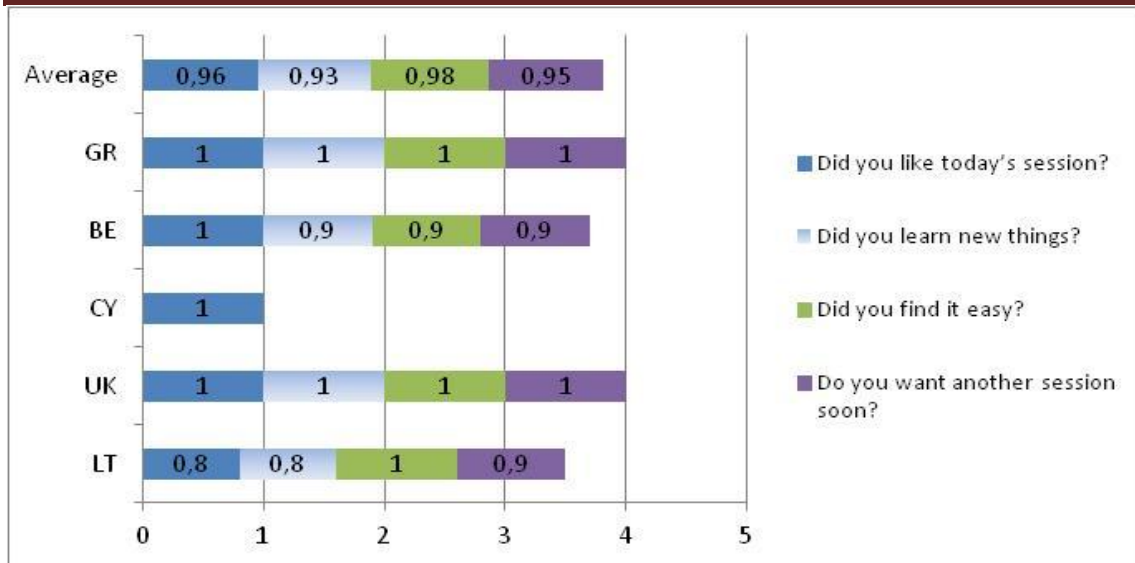


Figure 25: Consolidated feedback on ViPi pilot sessions

The consolidated partner data shows an overall very positive trainees' opinion about the piloted ViPi products.

Although all feedback is very positive, there are slight variations among the summary data: it seems that the most appreciated aspect of ViPi products used for learning were perceived as easy to use (over 98% of respondents agreed with this statement) and almost at the same level assessed enjoyment in the sessions (over 96% liked sessions) and willingness to continue (over 95% agree with this statement). According to the results it looks that some trainees found challenging to define if they had learned something new. And even the results are very positive (over 93% indicated they did learn new things), it can be an area for further investigation - to define influence of used teaching strategy, student ability to take responsibility over learning goals, learning personalisation and other related variables.

4.5 Trainees feedback on the training sessions - Consolidated Findings

The subsections below present the feedback of the trainers' observations during pilot sessions, per piloted outcome. Further details are given per pilot site where available.

4.5.1 ViPi Learning Material: Curriculum and Training content

The material was in general well received. The pilot sites' trainers reported high or very high engagement level in using ViPi learning material. The training success and engagement depended on its adaptation: the content was simplified or enhanced with additional explicit information – depending on the individual trainee profile or the trainee group's profile.

In the case of trainees that had a high level of ICT knowledge, the existing training material was not fully assessed. They were however engaged by advanced course material that was created specifically for them. This was for example the case in Greece.

Where high engagement could not be achieved with the e-learning content, practical, gaming or paper-based materials were used to encourage or reward trainees.

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An average assistance was reported as given by the trainers for using each specific outcome in BE, CY and GR. In the LT and UK cases trainees needed considerable extra assistance.

In the UK case, trainees of intermediate or basic ICT level during the sessions required much more assistance: including the help of a TTS (Text to Speech) system in the web browser, or by trainer assisted reading. Some higher functioning students could read the material well by themselves. In the LT and UK cases trainees were assisted with additional content explanations or individual assistance while completing certain exercises and tasks.

For the BE pilot, 6 trainers were involved throughout, as nearly all of the participants needed personal support. This worked very well, especially since most trainers had had past experience in supporting people with disabilities in ICT training.

The course material was improved throughout the pilot, taking into account the comments made during the pilot as well as in the earlier trials, improving images, text content, game content, and visibility of game links, typographical errors and required changes in the overall content.

Participants in BE, CY and LT pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development. However, in the UK, additional feedback was provided on detailed changes and updates on course content including additional elements, present content updates, improvements and extension, better linguistic expressions, and observed errors in content or interface, whether it was provided on PC or printed version.

The end users, according to their level of ICT, expressed their feedback on the tested material:

- Advanced users underlined the content universality for **benefits of a wide range of students with disabilities**
 - o “The existing course material would be very useful for people with lower ICT knowledge.”
 - o “I will be very interested to see also the training material for supportive technologies (*informed about ATLEC project*) and also the games for social competence and creativity (*from SGSCC*)”.- (CY)
- Very little unprompted feedback was given by students with intellectual disability and hence extensive importance was placed on the observation procedure in the UK pilot. There, the students were sometimes prompted for opinions when important issues were observed. The following consolidated comments show students certainly **benefitted**:
 - o “Examples and actual carrying out of tasks were very helpful and preferred as my reading is not that good.”
 - o “The course material is useful as reference for me when I come home and I decide to read what we learned in lesson.”
 - o “We were able to select those parts in the curriculum that were most applicable to our real needs. Examples and actual carrying out of tasks were very helpful and preferred as my reading is not that good.”
 - o “The course material is useful as reference for me when I come home and I decide to read what we learned in lesson.”
 - o “Very good and productive session.”

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The material's efficiency was highlighted by the trainees' eagerness to receive the trainers' handbook and the document on blended educational framework.

End-users were very excited to have a training on issues that they did not know and always wanted to engage with it (e.g. video subtitling, creation of a blog website, video editing). So, when we created the enriched course material they assessed it to its full extent - Greece

Not all students tried the profile editor. Early in the pilots, errors occurred where data was lost on attempting to annotate the profile. This was reported and fixed.

Depending on the needs of the participants, additional aspects were taught, such as playing music and videos, but also searching for relevant information via a search engine, while the usage of touchscreens was taught to all Belgian trainees as almost all needed it at their work when interfacing with machinery (in sheltered workshop environments).

Safe internet and online security were also addressed, especially when social media usage was taught. This was a very important issue, as most trainees were unaware of dangers when using social media. Their often very open nature resulted in starting online "friendships" with a lot of people they simply did not know. Through a number of cases and examples, Belgian participants were taught the core principles of safe internet usage.

There was also feedback on the training material itself as described below. Where negative aspects were identified this was addressed at the earliest opportunity:

- "Too much text in some places, without images, e.g. in the security section. Also if I use the link to go to an image, there is no way to go back to where I was. Also need to give emphasis in some keywords, with bold."
- Assessment Questions of curriculum: these questions have been already used in class, with very good comments.
- Game content proved to be sometimes too complicated, e.g. the words were too difficult to spell.
- Localization of content: Some of the training content was not available in Greek.
- All these comments were taken into consideration and updated according specific pilot site needs.

Conclusions

- The ViPi course content proved by all pilot sites as appropriate to use for ICT beginners.
- There is a very direct connection between students' capacity (physical, intellectual and ICT) and learning success - the content needs very precise modifications depending on the participants' profile and needs. Trainers have to be ready to take the most appropriate level of ViPi content, and to work on its adaptation to meet a specific groups' disability and ICT level.
- Trainers working with trainees with intellectual disabilities and intermediate or basic ICT level materials must provide assistance to help with use of ViPi training content in lessons. It is not appropriate for these students to be expected to work independently on the majority of materials.
- The content units related to more technical skills are less appropriate to the students with intellectual disabilities.

4.5.2 vipi-skills.eu portal

The pilot sites' trainers reported neutral or high engagement level in using vipi-skills.eu portal. However the high engagement was reflected only to those portal parts which were piloted by trainees (preselected by trainers and relevant to the target group).

An extra or average assistance was reported as given by the trainers for using the vipi-skills.eu portal in BE, CY, GR, LT and UK.

Some of the pilots used only part of the portal functionality, e.g. registration and logging into ATutor. The other use of the portal was reported as not appropriate to the user group with intellectual disabilities, and is more pertinent to their trainers to allow them to discover and access content suitable to train the students.

Trainers in BE, CY and LT pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development. However, additional feedback was provided:

- Even if the end-users were of advanced ICT knowledge, they found the portal not very user-friendly and mostly technological – oriented.
- The web portal was not fully accessible to the student, physically or at language level. It requires trainers intervention.
- Users had experienced problems in using ATutor – some issue related formatting and menu functionality; difficulties to use for the users with visual impairment, and intellectual disability. Additional training could be provided to trainers in assisting with accessibility settings in A-Tutor.

Some technical improvements were made to address comments about the portal functionality:

- the link “access the online training environment” shortened to fit on one line.
- issue with drag and drop of items and changing some text fields at the same time before doing a save (portal user profile editing)
- Issue with an updated ATutor password. Updated to link with ATutor automatically.
- Portal registration/ Logout of Portal: directions next to register buttons added. Corrected some misleading navigation links among different languages and registration steps.
- General sections of Portal: AAA buttons added for easier changing of font size.
- Portal community facilities: the three community building functionalities (i.e. members, groups, activity) grouped under a single tab/button.

The functionality of the LO guided search, Profile, Profile edit was not immediately understood and needed prior explanation given by a trainer.

The observations indicated that the end users with advanced ICT skills were confident with portal use and navigation, but entries were not always understandable.

The end users with intellectual disabilities found it much more challenging. As stated by trainers – there were no comments, but the students who took part often needed strong guidance to undertake this part. For students with intellectual disabilities, trainer assistance was required for this part.

The trainees' comments on tasks where they were able to follow illustrate the obstacles they met:

- *I can easily tick and select what I am interested in, but I do not always understand all entries.*
- *This was most difficult for me to use.*
- *With help of the trainer I could use it, but is not that easy.*

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- *I suggested some of the entries, so my trainer entered them.*

The trainers noticed that

- the interface is good for people with technical ICT knowledge and with moderate to no learning difficulties, but rather difficult for others due too many functionalities.
- Several portal functional issues needed to be better explained to user: issues with time delays in the LO page; difficulties in understanding the concepts of profile and LO annotation and guided search; difficulties with searching; creating an email account, to register and sign in the account – to make it more clear to users.

The trainers agree that the impact will be made clearer when more learning objects are uploaded. They also suggested to show an example to understand how to make searching and to provide more explanation on “Exact and Relevant matches” in the results – perhaps a pdf document with examples (file with examples etc. or a video) could be developed for better exploitation of the portal.

Conclusions

- the portal is easy to use and to navigate by the end users with advanced ICT skills.
- The interface is good for people with moderate to no learning difficulties, but rather difficult for others due to many functionalities.
- In terms of intellectual disability, the portal is seen as more of a resource for the trainers to locate (LO search) and deliver (A-Tutor) suitable training materials. Trainer assistance and training or group work sessions will be required for these students to access to the portal delivered content more independently.
- the impact of the portal depends on the uploaded learning objects and clear instructions how to use all services.

4.5.3 vipi-skills.eu mobile app

The pilot sites’ trainers reported a high to very high engagement in all countries. The trainers were giving average or extra assistance to trainees.

Trainers in BE, GR pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development. In CY and LT, the app was defined as not appropriate in cultural and development terms – mainly referring to the language localisation issues on the mobile interface. The UK site didn’t pilot this outcome due it not being appropriate to the student intellectual disability level.

There were some comments by trainees about the screen size which they considered too small to use, and the trainee preferred to work on the trainer’s tablet, because that was much easier to use. Some users liked the easy way to use it to reach the content with few clicks. Extra costs were also mentioned as this app needed internet and especially mobile internet expenses were mentioned. Some comments were related to functional issue – things to improve –to correct the display of results.

The trainers underlined the financial issue: the mobile app is useful, but the target group is financially not able to purchase smartphones, especially because many are also under budget control. Trainers as well reported some technical issue to be reviewed: e.g. not always able to connect to the portal and retrieve LOs.

Conclusions

- the mobile application of ViPi is highly engaging but needs more guidance than other ViPi training instruments to make users understand all functionalities.
- the mobile application is useful, but the target group financial capacity needs to be taken into consideration.
- some application functions need to be further developed and piloted to support full exploitation of the mobile interface.

4.5.4 ViPi Desktop Games

4.5.4.1 Rob the Mob

The pilot sites' trainers reported that assistance with this game varied from not needed to extra assistance. Trainers assessed this game as highly or very highly engaging.

Trainers in UK, LT pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development. In CY and BE they were defined as not appropriate in cultural terms.

The game in the UK pilot site was used infrequently with the intellectual disability user group as many of the students were not high functioning enough for the game. Those that used the game were engaged by it as an alternative way to learn the materials. The game requires some understanding of numeracy and literacy. It could feasibly work better with these users in a teacher led group work context.

Some additional comments were made on the game content:

- *It's an easy way to learn about ICT. Easy to use and to learn about computers and software*
- *'Now I will know it! (meaning of computer commands)*
- *I was learning at home. I take notes to remember.*
- *Enjoying - "I can answer all questions correctly!, I learned new short cut keys"*
- *Can I find text-to-audio application for reading in Russian?*
- *Sometimes some letters were not working, it was a bit disturbing, because trainee was hoping for better results.[this was addressed as a matter of urgency]*
- *I beat everyone finally, but I needed lots of trying. I now succeed in answering all questions correctly.*
- *I played it with my wife, and we both worked together to answer. It was fun. Very good and easy to use.*

Trainers also noted that trainees were very involved - loudly discussing about the game navigation, eagerly listened suggestions, were very enthusiastic about received results, commented own successful results, and tried to avoid assistance from trainer. It was mentioned many times that it was fun.

Trainers reported that the trainees were overall very positive and enthusiastic about the game: *interested and curious about IT specific terms and its translations to native language; wished to participate in such learning sessions because of the games used; liked to play, believes that his skills improved; were very positive and enthusiastic about own achievements. Users also commented that information was useful for getting to know and practicing and it was easy to play.* According the observations the trainees felt self-confident to use game independently, they asked for a game copy to practice at home.

Trainers found game instructions easy to understand. However it depended very much on the target group profile – some users needed to take some instructions at first. It was underlined by trainers that the

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game needs some further explanations about how to play (e.g. it was not clear that a two-steps click is required to play a card). Even the trainees were very quick to understand game rules, to understand the navigation teacher's assistance was needed from time to time. Trainers were appreciating the online access to the game and also the availability of a Games Editor which allows the customization of the content and the use of the game in the classroom for subjects different to ICT.

A key issue here was that many of the participants are under budget control and guidance due to debts. So the betting aspect is somewhat worrying. As a result we gave some guidance at the very beginning to point out that such betting via this game is acceptable, but that other real betting is dangerous.

4.5.4.2 Escapology

The trainers reported an average or extra assistance was needed for users to play the game. According to the observations this game is highly engaging.

Trainers in BE, CY, UK, LT pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development. However indicated that game concept only suited to very high functioning members of the Intellectual disability test groups. In the trainers' opinion this game is appropriate to users with good literacy skills, and not for severe intellectual disability group. The game was mainly used and well appreciated by users with good literacy skills.

Some further comments on technical issue made and addressed in several language versions:

- Some issue with appearance of language specific characters (solved)
- Some difficulties with the size of the lines. An option for bigger fonts and lines would be appreciated.
- Some issue with downloading the editor for the games.

User comments demonstrate that game was challenging to majority of users:

- *"I need to memorise new terms" - new computer term, different windows on the screen*
- *Difficult words, trainer entered new words, but was still difficult.*
- *I learned to spell words, but I found all of them quite difficult. Also long words. Difficult.*
- *Words are very difficult to guess.*

The trainers' general comments about the Escapology game were related to the game content itself - it was reported that many trainees needed more support with the Escapology game because of difficulties to guess proper words. The fact that the reading and writing skills of most participants was rather poor caused problems to play the game successfully. They tend to write what they hear when speaking; so many words simply are not known to them in a correct spelling. By some trainers it was stated that low literacy meant Escapology was not that useful (UK pilot site). It was suggested that the information in the introduction must be shortened - it is too long and confusing at the end (Greek version). The Belgium site also reported that the words (in the game) were considered by most as being too difficult and as a result, simplified words were entered. In Lithuanian case as result of several synonymous words for the same IT object, trainees got mixed among them and needed extra explanations.

The highlighted fact here is that the word content (which is easily editable with the provided editor package) should be examined and edited by the trainers prior to use to suit their students' capabilities.

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4.5.4.3 True/False Quiz

The trainers reported that assistance was limited to not needed for the users to play the game. Trainers considered this game as highly engaging.

The game was very well received by students of intermediate to high functioning levels. It was seen to consistently engage the user group, and successfully reinforce and test learned content.

Trainers in BE, CY, GR, UK, LT pilot sited considered the appropriateness of the material as good in terms of cultural, technological, language and development.

Additional comments were provided to improve the game content quality:

- Replaced scanner image
- Didn't understand some of the meaning of the questions on social networking
- Caps lock replaced by shift lock
- Change in English requested translations
- Rephrased touchpad description
- Fixed missing image of desktop
- Fixed PDF format made by Quiz 1 game
- Right arrow did not start game - clicking on the game canvas fixed.
- Yes/No Quiz: Consistent controls with keyboard important – more trouble to correct
- Yes/No Quiz: user skipped through very quickly on intro pages, the first question then loaded as blank.
- Rephrase the intro text to tell them to click triangle not arrow, or press arrow in keyboard.
- Users sometimes skip past rationale in frustration – lock quiz until sound file ends?
- Webcam image could be brighter clearer and more representative
- Yes/No Quiz: clicked the arrow on screen when trying to start game – rather than keyboard or the actual button.
- doesn't tell you what to do after answering questions
- On playing second quiz game said "I know!" when the intro screen began reading. Perhaps remove these from the separated games?
- etc.

Several other updates and changes were made while piloting and collecting feedback from the trainees.

The overall feedback from observations indicated that the game questions are appropriate, although sometimes a bit difficult and needed some effort to understand. Trainees' comments were positive and showed their self-confidence in playing the game:

- *On starting 4th quiz game participant stated "I love this".*
- *I just want to try the games when given more options by Andy*
- *Liked the voice in the Y/N quiz*
- *The quiz was my favourite part*
- *Commented on computer command - to open file - double click - for limited hand kinaesthetic mobility using selection and enter*

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- *We played this often in group during the training, whereby we all discussed in group why a certain solution was good or bad, and this made us think all together.*
- *Very good. I played it almost 20 times, so I know the answers now!*
- *Played it with my husband, we learned a lot from it.*
- *Best game!*

Trainers reported some obstacles with technical aspects of the game:

- User found it very hard to envisage the left and right arrow concept to move the selection and the space to select
- Font for quiz 5 different to that of computer parts quiz, Question 2 phrased badly OFS12 [these were fixed immediately on reporting]
- The audio in the text-to-speech functionality, is very basic (non human-like).
- Yes/No game (also applied to True/False): It would help a lot if there was an editor for these games as well.

Pedagogical aspect was reported as very effective:

- Game motivating student – gets very excited and jumps arms up when hitting answers button
- Topics are interesting not only for disabled people with intellectual disability.
- Player commented a lot, openly expressed opinions - related to more difficult questions, also receiving results.
- Trainee was asking when will be next session in order to participate.

This game was clearly the favourite of the desktop games among the participants. The interface was easy, the audio support was welcomed because many participants had poor reading skills. In the end the majority of the participants were able to complete almost all questions without mistake. This was also played in group, together with small trainer interventions whenever needed to clarify some of the questions and replies.

4.5.4.4 Stay Safe

Trainers assessed this game as highly engaging but also requiring extra or average assistance.

Trainers in BE, CY, GR, LT pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development. It was not appropriate for intellectual disability and not used in the UK pilot site.

The observations indicate that users found the game quite challenging to use:

- *Difficult, and difficult to read on screen.*
- *I did not understand many questions. Good that the trainer taught me things and explained it further.*
- *This is difficult.*
- *Good, I learned to be careful with mails.*

Trainers reported the game as very good for beginners in email communication but also for others with little literacy in ICT. However the trainers found it quite difficult to use it for educational purposes: in

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their opinion *the game suffers from a cluttered screen, and this did hamper the readability of the game*. It was also reported that *every question had to be explained in easy language, and this was quite time consuming*. In trainers opinion the *interface should be made easier and more attractive. As it is now it is dull/boring*. As overall impression trainers' underlined that *users liked the game but were not impressed with graphics. There was a technical issue in that the game was designed to use inbuilt XNA text to speech, which unfortunately failed to work when transferred to the non-English speaking sites*.

4.5.4.5 Fly Swat

The trainers reported that assistance was not needed to play the game by users. According the observations this game is highly engaging.

Used during the piloting for input technology (keyboard/mouse) training, and to encourage concentration on other materials by offering playing the game as a reward after material has been covered. The game was found to be engaging by all users who tried it. The level of engagement enabled lower functioning users to concentrate for long enough to understand about individual input methods (left mouse button, space bar), and remember the method between training sessions.

Trainers in BE, CY, GR, LT pilot sited considered the appropriateness of the material as good in terms of cultural, technological, language and development.

Additional suggestions were provided how to make the game more appropriate for the target group:

- To add intermediate Flyswat speed between low and med
- To add an optional audio prompt to the game? E.g. SWAT IT NOW!
- Mouse pointer went off game and player lost control.

The students' comments indicated that they had high involvement:

- *'it's too fast' – about the medium mode after a missed swat*
- *Love it!*
- *Helped me to use the arrow keys!*

Trainers defined it as an easy and straightforward game, which was appreciated because of the easy usage, and because it had a good impact on getting used to the arrow keys. The trainers underlined, that the game is good for practice by users with difficulties in concentration. Trainers suggest that lower ability users who were unable to use the majority ViPi games, were using Fly Swat, and benefitted from it. This game was also sometimes used as a reward or incentive for good concentration.

An example of student progress:

- The user initially pressed mouse buttons randomly. The game got her to use the correct (left) mouse button.
- Using the keyboard mode, the user began to realise that she had to press a particular key to cause the action.

Conclusions

- **The Rob the Mob** game is a highly engaging game as an alternative way to learn the materials. Trainees were very involved and quick to understand game rules, although to navigate, some trainer assistance was needed from time to time. Main issue here was that many of the

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participants are under budget control and guidance due to debts. So the betting aspect is somewhat worrying. Some guidance at the very beginning to point out that such betting via this game is acceptable, but that other real betting is dangerous, is highly recommended.

- According to the observations **The Escapology** game is highly engaging. However many trainees needed more support with the *Escapology* game because of difficulties to guess proper words. The game was mainly used and well appreciated by users with good literacy skills. The fact that the reading and writing skills of many participants was rather poor caused challenges to play the game successfully.
- **The Stay Safe** game was evaluated as very good for beginners in email communication but also for others with little literacy in ICT. However it is quite difficult to use the game for educational purposes: in their opinion the game is limited by a cluttered screen and too simple graphics.
- **The True/False Quiz game** was clearly the favourite among the participants. The interface was easy; the audio support was welcomed because many participants had poor reading skills. The game was very well received by students of intermediate to high functioning levels. It was seen to consistently engage the user group, and successfully reinforce and test learned content.
- **The Fly Swat** game was found to be engaging by all users who tried it. The level of engagement enabled lower functioning users to concentrate for long enough to understand about individual input methods (left mouse button, space bar), and remember the method between training sessions.

4.5.5 Mobile Games: Memobile

The trainers reported that assistance with this game was given average intense to not needed.

Trainers assessed this game as very highly engaging in Matching Pairs and Starter Kit and a bit less engaging concerning the Quiz game.

In general the mobile games were well received by all users. The 3 games offered a range of ability levels so that the suite could be used with almost all of the participants. Students were seen to remember some of the computer parts, to improve their scores with repeated playing of the starter kit game, and also to remember the power button sign. The students with enough ability to do the quiz game enjoyed it as an alternative learning method.

Trainers in BE, CY, GR, LT pilot sites considered the appropriateness of the material as good in terms of cultural, technological, language and development.

Additional comments were provided to improve the game quality.

- **Matching Pairs Game**
 - Cartoon images possibly not easily equated to real devices
 - Content 'components' is large word, perhaps some rephrasing would be good in this part.
 - Caps lock instead of shift lock – changed.
- **Quiz game.** Trainers reported that users enjoyed Quiz. However some users considered it being quite long. It was suggested to be broken down into shorter segments (5 or 6 questions each). Other comments also indicated that the use of shorter sections would be recommendable:
 - is TOO long. Need shorter sections which can be tried individually.
 - too many shortcuts for our users to take in all in one go. Some content needs altering.

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- content of game a little high towards the end in places for this user group. Revisit question phrasing and content (for this usergroup)
- no score given at end of bonus round
- user could not read instructions/learning material. Could it be made easier to access games (particularly 1 and 2 where literacy is of little importance for the games themselves).
- User could not read the learn info. It was fixed (using "Skip" button)
- Starter Kit
 - Some users are too slow for this – Need a slower speed for the game.
 - Can game ignore a constant finger on screen – user often put one on when holding the device
 - need slower mode
 - bad English in instructions

General suggestions:

- MP3s with spoken instructions would help a lot here. With perhaps a speak words toggle in the main menu (with symbol on it!).
- Maybe the game could have an option to speak this
- Can bottom menu be hidden in Memobile on Samsung tablet (to manage issues with students who do not hold their hand clear of the screen).
- Issue with tablet - accidentally accessing the menu at the bottom interferes with the process

Trainees' observations proved that users really liked the game. Users were clearly interested in the competitive element of this game. Some users wanted to continue playing it after the session (and did carry on playing the game into his break – in UK case, asked to install on own mobile and use at home).

The trainees' comments indicate enthusiastic engagement and enjoyment of the game.

- *I like the tablet games best*
- *"This one I like very much"*
- *Maybe a bit too much text*
- *Like very much, this I like*
- *If the session will be next week too?*
- *It only played on the expensive smartphones of the trainer, so I could not take it home on my simple model.*
- *Fun to play*
- *I played all games, nice colours.*
- *I used it to repeat what I learned. I played all games correctly in the end!!!!*

Other observations prove positive effect on trainees:

- User grew in confidence with starter kit game
- Remembered shortcuts well
- When playing very concentrated
- Tried Memobile Pairs to see what user remembered (asked him to voice what he uncovered, remembered all but speakers, monitor and scanner).

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- The students with enough ability to do the quiz game in general covered the first 8 questions. The content in further questions was often beyond unit 1 scope.

The trainers agreed on the games attractiveness, very good graphics and attractive design. They did make a list of suggestions how to improve the game:

- Not possible to play Memobile on computer.
- An editor would be very useful to the teachers.
- Could quiz be broken down into shorter segments (5 or 6 questions each).
- No score given at end of bonus round.
- Some users prone to skipping instructions/learning content of game.
- Audio would be helpful on the game's learning content

The trainers assessed this game overall as useful, attractive, portable and engaging. It was rated the most attractive of the games. The game was also convenient to train on the usage of touch screens. It was also reported as the most popular among the ViPi outcomes, due to its playful characteristics. Some trainers reported minor difficulties e.g. some trainees couldn't easily reach the buttons, some of them needed to have bigger interface. For this reason, this game was played mainly on 10.1" tablets in most sites.

Conclusions

- The game's attractiveness, graphics and design was reported as the most popular among the ViPi outcomes. The students with enough ability to do the quiz game enjoyed it as an alternative learning method.
- The game is convenient as well to train on the usage of touch screens.
- To enhance Memobile educational potential some improvements were suggested and which will be considered for future extension: an editor to change game content, to divide the quiz into shorter segments (5 or 6 questions each, to provide a score at end of bonus round and consider using audio for learning content).

4.6 Case studies

The following case studies from the various pilot sites highlight where the ViPi outcomes have benefitted the target group in being trained in ICT.

4.6.1 Case Study 1 (UK)

4.6.1.1 Introduction

Student UK1 was 17 years old, and had Down 's syndrome, characterised by severe intellectual disability, along with limited speech, and some physical limitations. On arrival at the first session she was observed to be wary of the technology. She has difficulties in communication and also struggles to assess her own skills. She was inexperienced with computers.

4.6.1.2 Participation

Over the three training sessions with student UK1, she progressed from being able to recognise that things happen on the screen when she used the input technology to being able to correctly use the devices. In the initial session she was observed to move the mouse around watching the pointer on the screen and randomly click all of the mouse buttons. By the final session she was able to use the mouse or the keyboard to move and control the fly swat game, and time interactions to swat the fly.

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Initially the student was disinterested in the course materials as presented. Her lack of literacy and input device control meant that the e-learning environment did not offer her much. She showed an interest in the images. This was developed by the trainers who worked with the ViPi labelling exercises, the tablet version of Memobile (pair matching game and Starter Kit game), along with the physical presence of ICT devices to teach her what the devices and peripherals were. By the end of the three sessions she was able to identify several key components of a computer.

One of the real issues with working with Student UK1 was that she had problems focussing her attention on the tasks in hand. Throughout the training sessions the trainers varied the approach, allowing her to work with the materials which were interesting her at the time and switching when required. She reacted well to this approach and by the second session was suggesting her own activities. Practical exercises were also used, for example when she expressed an interest in taking photos with the tablet the trainers allowed her to do so, and copied the images to the computer, allowing the student to learn about turning on the device, using the touchscreen, selecting appropriate icons and buttons, and using a USB cable along the way.

4.6.1.3 Achievement

The student was initially wary of the technology being used and not confident to give responses when she was unsure about things. Throughout the pilot sessions her confidence along with her engagement was seen to grow as both the student herself and the trainers learned how to work with her to improve her skills and knowledge. She was also observed to develop in confidence at her ability to answer questions correctly.

Over just 3 sessions she gained the ability to turn on the tablet computer, locate and select a specific icon to start an app, hold the tablet and take a photo. She also took important step in using input technology on a desktop PC, understanding that the different mouse buttons and keyboard keys do different things, and that she herself could make things happen on the screen by using the right keys and buttons at the right times. These are important steps and recognised in the P Level ICT curriculum used by the school.

4.6.1.4 Benefits from ViPi output

Student UK1 used:

- ViPi ATutor course
- ICT equipment that was made available at the training room, including all-in-one touchscreen PC, desktop PCs, mouse, keyboards, screens, USB stick, tablets, phones, etc.
- Printouts of the ViPi labelling exercises
- ViPi Desktop game FlySwat!
- ViPi Mobile games

4.6.2 Case Study 2 (UK)

4.6.2.1 Introduction

Student UK2 was 16 years old, he has physical disabilities that mean he must use a wheelchair and is unable to easily use the mouse or keyboard for prolonged periods. He also had intermediate intellectual disability, with low literacy skills. He had access to a computer at home but rarely used it, he had a mobile phone, but only an old style one with buttons, and had used an iPad at home also.

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4.6.2.2 Participation

Student UK2's lack of literacy meant that he could not easily read the textual content on the e-learning environment. The trainers firstly showed him how to use the TTS (Text-To-Speech) systems installed on the machine. This required highlighting some text and clicking on the speak button. Over the four sessions, with repeated guidance, he learned how to do this procedure empowering him to go through the materials at his own pace.

Student UK2's physical disabilities also caused problems as he struggled with fine movement of the mouse, and his hands tired through the sessions to the point where he needed assistance. The trainers experimented with varying the speeds of the mouse, and using assistive techniques like mouse keys. Though no perfect solution was found for him, he was making good progress with using mouse keys, and he was made aware of other possibilities of changing settings and devices.

This student showed a high level of engagement throughout the sessions, whether using the e-learning material, the games or the practical exercises. The student struggled with the nature of the Escapology game due to low literacy skills, but coped well with the yes no quiz game. He also enjoyed playing the Memobile tablet games.

By the end of the four sessions he had covered material on types and parts of computers, turning the computer on and off, input devices, and web browsing. He found practical exercises on web browsing particularly engaging when relevant materials such as his school's website were used.

4.6.2.3 Achievement

Although the student had very complex needs both physically and intellectually, throughout the sessions he maintained a high level of engagement with the materials and games. He was keen to learn obviously enjoying the use of the technology and seeking to make himself more independent with its use. He was keen to try to use the input technologies but only previously familiar with mouse and keyboard technology, which he struggled to use in a prolonged session.

Positive results in the Yes No quiz game showed that the student had retained information between sessions. The sessions also showed the user that there are alternative methods to make the technologies work better for him. With the mouse keys methods he began to learn, he became more independent at controlling the computer with the guidance of the researchers. With the text-to-speech technology, he became more empowered to understand the computer's output with his limited literacy. By viewing the school website he was made aware that there was information available to him through the computer that interested him.

4.6.2.4 Benefits from ViPi output

Student UK2 used:

- ViPi ATutor course
- ICT equipment that was made available at the training room, including all-in-one touchscreen PC, desktop PCs, mouse, keyboards, screens, USB stick, tablets, phones, etc.
- ViPi Desktop game Yes No Quiz!
- ViPi Memobile games on the Android tablet.

4.6.3 Case Study 3 (UK)

4.6.3.1 Introduction

Student UK3 was 18 years old, and had a moderate intellectual disability, and minor physical limitations. At home he has access to a desktop computer and a mobile phone (not a smart phone). He uses his computer mainly to play games (keyboard controlled). On arrival at the first session he appeared confident but inexperienced with the input technology. He finds it difficult to stay focussed on tasks in the classroom. He considers his literacy skills to be better than his numeracy.

4.6.3.2 Participation

Student UK3 was able to log in and to read the textual content of the e-learning environment. His reading tended to be more focussed on the words than the sentences however, so he was shown how to use the screen reader to help him to assimilate the information he was reading. He was still sometimes confused by the wording of some of the materials. Any badly worded sections were noted and later rectified by the researchers.

This student was prone to losing focus on the course material, and so games were used on a regular basis to bring his focus back onto the material. At the end of the first session he had been playing the Memobile pair matching game, and was so engaged by the activity that he chose to stay into his break time to continue playing the game. After this observation, the treat of playing the games was used as an encouragement by the researchers. When the student lost focus on materials he was reminded that once the content had been covered he would get to try a game.

The student opted to play Rob the Mob in his second session, but struggled with the game due to the numeracy skills required. He quickly lost interest in this, but focussed much better on the yes no quiz game with a more straightforward format. He was highly engaged when playing the tablet games. He also found the practical exercises undertaken to hold his focus much more than the e-learning materials.

The third session allowed the student to demonstrate that information had been retained between sessions by scoring 5/7 in the yes no quiz on the materials he studied the previous time. He also demonstrated that he had remembered how to unlock the tablet and start the Memobile games himself. He was also able to exit the games and shut down the tablet.

4.6.3.3 Achievement

The student had a tendency to lose focus on tasks and required interesting and exciting methods to maintain concentration. The mix of games and reading work in the ViPi pilot allowed the student's focus to be brought back to learning with the use of fun and interesting games based on the same learning materials as the course.

The worth of the diversity of the games was experienced yet again as where a student is weaker in a particular area (in this case numeracy), other games can be used which avoid this weakness, and allow the student to still have an engaging delivery of the materials.

In every session, the ability of the games to increase the engagement of this participant with the materials was noted by the observer. The student was seen to retain information he was taught between sessions and managed to identify such items as scanners, printers and other peripherals. He also remembered procedures he had been taught such as how to shut down the computer safely.

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4.6.3.4 Benefits from ViPi output

Student UK3 used:

- ViPi ATutor course
- ICT equipment that was made available at the training room, including all-in-one touchscreen PC, desktop PCs, mouse, keyboards, screens, USB stick, tablets, phones, etc.
- ViPi Desktop game Rob the Mob!
- ViPi Desktop game Yes No Quiz!
- ViPi Mobile games Matching Pairs and Starter Kit

4.6.4 Case Study 4 (Belgium)

4.6.4.1 Introduction

Student B1 (male, 37) has Williams syndrome and is a very communicative person, with a big interest in everything associated to Studio 100 (produce animation, cartoons, songs, etc.) and knows a lot about every personality appearing in the Studio 100 broadcasts. While he does use the computer and knows quite a lot of Facebook usage, he would like to know more about overall usage and security. Especially the bullying he sometimes faces online is a reason for him to get into the training and learn also about the insecure aspects of internet usage.

4.6.4.2 Participation

Student B1 is very keen on using his PC for everything possible. He now also has a laptop which he uses daily to go on the internet, exchange short messages with friends and to ask for clarifications where needed using Facebook chat. Student B1 was definitely one of the most enthusiastic people in the entire group, also stimulating others. This was especially the case during the training sessions that took place as a full group, and where some informal support pairings started with one trainee helping another trainee.

4.6.4.3 Achievement

Student B1 was focused on some aspects of PC usage (mainly Facebook), while the training opened some other areas to him, such as email, creation of simple documents and text editing, etc. but also highlighted the dangers of social media, something Student B1 had already experienced himself.

An important element was also the usage of Student B1's strong communication skills in supporting other participants, while also taking care of the "innocence" Student B1 displays towards the outside world and which might be abused, especially online. In this regard, Student B1 has improved his assessment skills of potential dangerous situations.

As Student B1 is working in a sheltered workshop environment, his improved ICT skills are also useful there, especially where they have to use a computer interface in some of their job activities (activation of a machine, entering volumes, etc.).

Student B1 has become more self-confident, especially when using social media since he knows now how to block improper behaviour and protect himself against that. Also he has gained skills in editing a document, that mean that he now can do this without having to ask for assistance. Also his contacts with his family have improved as he is now using email on a regular basis.

4.6.4.4 Benefits from ViPi output

Student B1 used:

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- ViPi course and training material (including videos and printed material)
- ICT equipment that was made available at the training room, including desktop PCs, printers, scanners, headphones, mouse in various formats, keyboards, screens, etc.
- Mobile training module, using the games. This was accessed via mobile as well as via tablet devices, thus also understanding touch interface interaction.
- Desktop games, especially at the beginning.
- ViPi platform to scroll through other applications that exist for Dutch speaking users.

4.6.5 Case Study 5 (Belgium)

4.6.5.1 Introduction

Student B2 (female, 47) has moderate to severe learning difficulties, but is living independently, is married and works in a local sheltered workshop. She is increasingly faced with the usage of ICT (PC and touchscreen) at her work, and became anxious about its usage. When she found out that ICT training would take place, she was eager to participate. It must be pointed out that at the start of the lessons she had never used a PC or laptop. But she was so eager to learn that she arrived at the first lesson with a brand new laptop. The training team did make some modifications to the Windows 8 interface to ensure she would be able to work more easily with it.

4.6.5.2 Participation

Student B2 participated in the past in activities organised by the local end-user organisation, but never in training related to ICT. Therefore, both the ICT training and the supporting trainers were quite a big leap forward for her. And while initially there was some doubt, after three months Student B2 used her laptop independently and benefited considerably from the regular training sessions.

Student B2 enjoyed learning ICT and in striving to get to know as much as possible, while focusing also on what exactly she needed for her job. For this reason, touch screens were extensively used with Student B2 during the training.

Student B2 was initially quite uncertain, and needed considerable support, both from the classroom trainer and a separate trainer who helped her on a face-to-face basis. However in the end it proved to be a winning combination, especially when her neighbour at the training lessons also helped and supported her.

4.6.5.3 Achievement

Student B2 was lacking self-confidence, and especially was anxious because of the new ICT skills she would need to know with a new machine being introduced at her workplace that necessitated the usage of keyboard, touchscreen and knowledge of computer basics. The training sessions came in fact just in time for her and strengthened her self-confidence, as well as allowed her to get accustomed to the computer skills required for her work.

She changed into a self-confident person, eager to learn and in frequent contact with the trainers. Just like with other trainees, also Student B2 was in the end helping out other trainees in learning new computer skills. This ad hoc peer supporting proved to be very useful and strengthened the confidence of the entire group of trainees.

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4.6.5.4 Benefits from ViPi output

Student B2 used:

- ViPi course and training material (including videos and printed material)
- ICT equipment that was made available at the training room, including desktop PCs, printers, scanners, headphones, mouse in various formats, keyboards, screens, etc.
- Mobile training module, using the games. This was accessed via mobile as well as via tablet devices, thus also understanding touch interface interaction.
- Desktop games, especially at the beginning.

4.6.6 Case Study 6 (Cyprus)

4.6.6.1 Setup of CY pilot

The main question of the pilot study in Cyprus, similar to all other pilot sides, was: “Can the ViPi ICT training methodology and outcomes improve ICT skills of people with disabilities?”.

The pilot study took place between June and early December 2013, in Cyprus, involving organizations and individuals mainly from Nicosia (School for the Blinds “Agios Varnavas”, Special Education School “ICTeach”), but also from Larnaca (G.E English Center) and less from Limassol (European Social Forum Cyprus).

The study involved 10 trainers/teachers of whom the majority practice teaching of people with disabilities while few of them teach ICT and other subjects in private classes and would be interested to attract also persons with different types of disabilities. Sometimes they do face such cases already. In addition, the study involved 15 students, mainly people with vision and mobility impairment but also few with learning and mild communication difficulties, of age 16 plus.

The study focused on training material from Units 2 and 3 of the ViPi Curriculum, since the involved students were not rated at the lower level of ICT familiarity. Both online and offline material was used in pilot sessions, including the training content, the portal for accessing and discovering learning objects, the PC and mobile games, the e-learning environment, etc.

The detailed pilot feedback has been recorded and submitted in the framework of the deliverable D23. Beyond the detailed feedback on the used outcomes, the students were asked both prior to, and after the pilot study, to rate their perceived levels in 12 key skills on a 5 point scale. The key skills used were:

- Being safe
- Being responsible
- Self Esteem
- Enthusiasm
- Numeracy
- Literacy
- Timekeeping
- Flexibility
- Communication and collaboration
- Basic ICT Skills
- Physical interaction with ICT

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- Confidence in use of ICT

These were mapped on a Competencies and Skills Progress Radar (CASPER). The results from the Cyprus pilot study, show that in most of the cases, involved students believed that their levels on these skills did not change or did not change a lot. This was different for the skills involving ICT clearly, as students realized that the material provided helped them improve their interaction with and knowledge of ICT.

The following section provides 2 case studies that have been designed and executed during the pilot study, with the main aim to extract structured feedback on the adoption of the ViPi outcomes, while at the same time offering training to the teachers on how the ViPi outcomes could be combined in offering blended education.

4.6.6.2 Introduction

Student CY3 is 17 years old and has mild learning difficulties. He is classified as “intermediate” on the ICT knowledge level, meaning that he is aware of technology and uses it in everyday life, however, he has no specific skills in using ICT tools for producing e.g. documents, presentations, etc. The sessions with the student were one-to-one sessions with his Teacher. The teacher was previously trained several times on how to use the ViPi outcomes, therefore she followed-up with the student without problems.

4.6.6.3 Participation

Session 1:

During the first session, the teacher explained everything about the study and received the consent of the student for his participation. He also completed the self-assessment questionnaire, with the help of the teacher. It was not obvious to the student how the all questions fit to the ICT skills of ViPi, therefore, the teacher took the time to explain that the general confidence and communication skills can be indirectly improved when knowledge about a specific subject is increased.

During the first session, the teacher opened the training material of Unit 2, specifically the section 2.7 on using email and security issues involved. At the same time, the teacher opened the e-learning environment on the pages of the specific course. No direct interaction of the student with the platform was sought at this session. The student had the chance to get an idea of the material, of an interesting subject and learn useful things.

The learning material seemed useful for delivering the course, however, both the teacher and the student found it difficult to cope with the quantity of text included in the documents and the online platform. So, the teacher decided to explain the concepts in few words and then used the assessment questions to extract more knowledge for the student through question and answer session.

Session 2:

Two days later, a second session was conducted with the same student. This time, the teacher introduced to the student the ViPi portal and explained its objective. Then the teacher asked the student to register on the VIPI platform and search to find learning objects relevant to his profile and the subject of their previous session (that is, Email and Security). It was obvious that the student faced technical difficulties and could not perform the registration process without the help of the teacher. The teacher explained how to use the email account to register and then confirm the account by reading an email, etc. By the

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end of the first 20', the student had learnt how to performing registrations on internet platforms; the process is similar in many cases and learning through the example helped.

The second step was to search for learning objects and this proved to be even more difficult. It was not at all obvious to the student how to use the guided search mechanism. The teacher again had to explain in detail and help him through the process, by asking questions and extracting the answers such as to make proper selections on the search tree.

By the end of the session, the student together with his teacher had found few learning objects relevant to the subject of email and security. Among them was the game "Stay Safe" of the ViPi project, but also a number of external sources. An important comment was that the search mechanism was too slow and this created anxiety to the student, as well as, prevented the class to run smoothly.

Session 3

The third session, beginning of the following week, focused on the use of games. The teacher first introduced the "Stay Safe" game which was discovered during previous session when searching for learning objects. The student run the game with no problems, however, he faced few difficulties in choosing the correct answer/action. It was obvious that although the student had been using email socially, he was not in position to identify all threats clearly. The teacher took the time to explain each case separately.

Next, the teacher introduced the Rob the Mob and Escapology games. At the Escapology game the student faced difficulties with the size of the lines. He would like to have an option for bigger fonts and lines. Correctly answering the questions and finding the words, was not an easy task, however, playing a game was attractive and engaging for the student. The teacher promised to edit the games using the offered Editor and make the content easier for the specific student.

Towards the end of the session, the student was also given the Memobile game, on a Samsung Galaxy SII device. He played the "Press and...Action" game with no difficulty and needed no support by the teacher.

4.6.6.4 Achievement

It was obvious by the first session that the student was not very confident with using an Internet platform and performing basic operations. However, by the end of the first session he managed to complete this task once.

The content of the introduced course (Email and Security) although initially familiar to the student, it proved to be more advance than he could understand. The "Stay Safe" game helped the teacher in taking the student step-by-step through the different cases of problematic email messages and explaining all possible issues.

It was also obvious that the games were much more intuitive than any other teaching tool. However, the mobile games were much more attractive than the PC games. Their difficulty level was also closer to the capabilities of the student.

In any case, the student benefitted by using the following ViPi outcomes, in combination:

- ViPi e-Learning Environment course (Email and Security), also offline in pdf.

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- ICT equipment (a PC at his school and also a Samsung S2 device offered by the ViPi project).
- Printouts of the ViPi assessment questions
- LO search mechanism on ViPi portal.
- ViPi PC and Mobile games

4.6.7 Case Study 7 (Cyprus)

4.6.7.1 Introduction

Student CY07 is in the age of 20-30 years old and she has severe vision impairments following an accident that happened when she was very young. She does not have any other type of difficulty in communicating and/or moving and/or learning. She has her own laptop that is properly configured by her ICT teacher, to be as much usable as possible. She likes using social media and also browsing through the Internet. She is working at a bank, answering phones of customers and directing them to the proper department. After being presented with the ViPi objectives and tools, she was curious to try everything and see how she could learn more on how to perform practical tasks using the computer (e.g. subjects of Unit 3 of ViPi curriculum, writing documents, preparing presentations, purchasing online, etc.)

4.6.7.2 Participation

During the first session with the student, the teacher offered the mobile game to play. It was obvious that the game was not made for blind users, therefore it was not possible for the student to play properly. However, the nice sound and explanations of the teacher engaged her in the teaching process.

The same situation appeared with other (PC) games, however, the teacher played the Rob the Mob game with her, simply asking the questions and pressing the buttons himself, to also rate the student's level of ICT knowledge.

After half hour of playing, it was clear to the teacher that the student was of intermediate level. He then introduced the e-Learning platform and asked the student to browse through the course (Unit 3.1-Writing documents). The student was using the free NVDA screen reader software (www.nvaccess.org) that helped her browse through the course. It appeared that she could follow the course tree and open and read the pages. However, the support of the teacher was required at least at the beginning.

The student was very happy reading the material, however, the provided alternative text on the images did not really helped her. The teacher supported her in this process by explaining each image separately with more words. By the end of the course, the student was aware of the basics of using MS Word and she even created her first document with content inside.

The second session with the same student continued with the training material and training questions (assessment), in Unit 3 of the Curriculum. The student was happy overall with the fact that accessible and dedicated ICT training material was available for free, however, she would love to have some audio games to support her in the learning experience.

4.6.7.3 Achievement

The student (effectively) used only the ViPi e-Learning environment and the pdf version of the assessment questions.

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The main achievement was the engagement in the e-Learning experience. It was the first time for her to try to learn something on her own.

4.6.8 Case Study 8 (Lithuania)

4.6.8.1 Introduction

Trainee LT03 was 45 years old, male and had mild intellectual disability, along with some speech and physical limitations. During the preparation stage for the pilot sessions in the Centre he was very shy and was not willing to attend a session. He didn't have PC at home and was inexperienced in computers. When the pilot sessions started he was doing other activities while group mates were at the computer lab. After two sessions he expressed willingness to look around and to join the session. At the first session he was assisted by a daily care centre staff assistant. He had difficulties in communication and also was not able to assess own skills; he was helped by the assistant.

4.6.8.2 Participation

After his first attended session the student LT03 attended 5 further sessions - all of the remaining available training sessions while he was attending the centre. He progressed from using mouse, opening the folder, starting the game to the independent game player able to start game again, to recognise computer alerts and to follow instructions during the game play (games "Yes/No", "True/False" were the most appreciated, also tried "FlySwat!" and Mobile games).

By the final session the trainee was able to use the mouse or the keyboard to move and control the quiz game play.

4.6.8.3 Achievement

The student was initially very much wary of the technology, shy and not self confident at any computer related question. He was scared to go to session, because didn't know anything about computers. During the pilot sessions his fear went away and he was visibly much more confident to learn about computers. His engagement was very much encouraged by the game play feedback, especially encouraging sentences at the end of the game and ability to see score achieved in the game.

Even though it was very little progress for the ICT beginner level, his attitude, engagement and self-confidence was seen to grow.

4.6.8.4 Benefits from ViPi output

Student LT1 used:

- ICT equipment that was made available at the training room, tablet, desktop PCs, mouse, keyboards, screens;
- ViPi Desktop game games "Yes/No", "True/False", FlySwat!
- ViPi Mobile games

4.6.9 Case Study 9 (Lithuania)

4.6.9.1 Introduction

Trainee LT06 was 46 years old, female and had mild intellectual disability, along with some speech and mobility limitations, and used a wheelchair. During the preparation stage for the pilot sessions in the

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Centre she was very concerned about the training sessions because of her limited language skills in Lithuanian. She has PC at home and was experienced in some computers' functions. At the first sessions she was not attending, but after two sessions she joined the session and asked to join again. At the first her session she was assisted with daily care centre staff assistant.

4.6.9.2 Participation

After first attended session the student LT06 attended 4 sessions. She progressed from using keyboard, opening the folder, starting the game to the game player able to start game on computer and tablet, to use tablet functions and follow instructions during the game play (Mobile games).

By the final session she was able to use the keyboard and touchscreen to move and control Memobile game play.

4.6.9.3 Achievement

The student was initially very keen on technology, but lacking concentration and not memorising steps to follow procedures within the games. She was very communicative, enthusiastic and eager to try. During the pilot sessions her attention and concentration on certain game actions became more precise and she learned not to rush with the device but to be careful in purposefully choosing where to click in order to obtain the desired result. Her engagement was very much encouraged by the game play graphics and animation (Memobile hero – Memo – appearance and congratulation text at the end of game).

Even though the student made slow progress through the ICT beginner level, her attitude, engagement and self-confidence increased.

4.6.9.4 Benefits from ViPi output

Student LT1 used:

- ICT equipment that was made available at the training room, tablet, desktop PCs, mouse, keyboards, screens;
- FlySwat!
- ViPi Mobile games

4.6.10 Case Study 10 (Greece)

4.6.10.1 Introduction

Trainee EL01 (male, 26) has Muscular Dystrophy. He graduated with honors (8.7 / 10) of the Department of communication, media and culture of Panteion University. He considers journalism, new media, copywriting and social media as his best sectors of engagement. He is very social person with a big interest in football journalism. For this reason he owns a blog, which he administers and updates continuously. Trainee EL01 also maintains a Twitter and Facebook account, promoting his blog.

4.6.10.2 Participation

Trainee EL01 is a lively person, very energetic very engaging with people and becomes in no time the centre of interest in a group. He is very keen with Internet technologies and exploits them for promoting his passion for journalism and football. Until now Trainee EL01 did not deal with the technical coding of his blog but his idea of creating a website brought up the idea of incorporating as training in ViPi the process of starting a web site from scratch. The process included the reservation of domain name, the

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selection of a host provider, installation of WordPress and its customisation and its later administration in order to create a site.

4.6.10.3 Achievement

Trainee EL01 has been focussed on the use of his blog, Twitter and Facebook through his laptop but training gave him the idea of learning the complete process of starting a website. His idea was discussed among the first 13 participants of the training sessions and we realised that this was an interesting subject for all.

The already advanced skills of Trainee EL01 in new technologies and social media improved further by getting involved with the technical (but necessary in this day and age) knowledge for bringing a website on air.

Trainee EL01 already started to implement the skills he acquired during the training and his new sports-related website will be online.

4.6.10.4 Benefits from ViPi output

Trainee EL01 used:

- ViPi course and the advanced training material, which was created specifically for the Greek trainees due to their advanced knowledge in ICT (including presentations and printed material).
- ViPi platform and the material for Greek – speaking people.
- Access to the training material via tablet device and his laptop, as well as Skype and Google Hangouts training.

4.6.11 Case Study 11 (Greece)

4.6.11.1 Introduction

Trainee EL02 (male, 61, with Multiple Sclerosis) has excellent communicational skills and great sense of humour! He is very interested in developing his ICT skills and accomplishing new exciting ICT tasks. He is an artist (photographer, painter and sculptor) and although he uses the computer and has even managed to create his one Facebook page, he needed to learn more about the way the computer works and get familiar with the available software tools that can help him create new digital drawings and edit existing photos.

4.6.11.2 Participation

Trainee EL02 uses a PC every day, as he likes reading news on the Internet and sending emails to friends. He was very enthusiastic about participating in ViPi training sessions and was pleased to find out that he could enter Skype and get ViPi training while he was at home, in his own secure environment.

4.6.11.3 Achievement

Trainee EL02 was focused primarily on the aspects of PC usage (Windows tasks and browsing) and the web browsing software and functions. He also studied the Help system section of the ViPi material, as he needed to take care of his hardware equipment and wanted to learn more about the trouble shooting issues and virus protection tools so that he could recover his pc –if needed- on his own.

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He also managed to study some of the Advanced Greek ICT training sections regarding the online image editing procedures and edit many of his own photos and digital drawings.

4.6.11.4 Benefits from ViPi output

Trainee EL02 used:

- ViPi course and training material
- His personal computer and his adjusted mouse, microphone and headphones set.
- Desktop online games in Greek accessed via his PC.
- ViPi platform to scroll through other applications that exist for Greek speaking users.

5 General conclusions

The ViPi piloting was overall a success in all pilot sites, and confirmed that the Multi-level approach of the training material, combined with the usage of games can yield very positive results. Here is an overview:

- The collected data show that the group of pilots consisted of a widely varied group in terms of ages, disabilities and ICT skill levels. The complexity of the target group necessitated a series of adjustments in terms of content and pedagogy in all pilot sites, and was to a large extent already addressed by the customised training content.
- The analysis identified the biggest progress in competences was related to ICT. It was visible in all pedagogical perspectives: *Confidence in the use of ICT (emotional dimension)*, *physical interaction with ICT (operational dimension)* and *basic ICT skills (cognitive dimension)*. It demonstrated the pedagogical efficiency of the ViPi deliverables in teaching basic ICT skills to people with disabilities. Furthermore, two social competences were positively affected as well: self-esteem and enthusiasm.
- The mix of teaching by using modular training material, combined with mobile and desktop games proved to be a winning combination. This is reflected in the overall feedback received from the end-users (trainees) and the overall satisfaction of the trainers with the obtained outcomes.
- The piloting results have shown that the outcomes of ViPi can provide a powerful and flexible set of learning materials to assist in training people with disabilities in the use of ICT. Where intellectual disabilities are present there is often a lack of focus on tasks, which can be addressed by switching between training modes. As focus is lost on the more dry reading and pictorial material, a hands on training method can be adopted using practical exercises, or training can be continued using directed game style approaches encompassing the very same course material that exist in the written and online courses.
- The games can be used as a reward for concentrating and remaining focused throughout a part of the course, as they are seen as a fun thing to do. This not only encourages the student to focus on completing the material so that they can get to play the game, but also will reinforce the learning by repeating the materials in a different and engaging format.
- Another powerful element in the ViPi methodology is that the ICT training is done using ICT itself. This enables a strong practical element to be used in the teaching, referring to physical ICT hardware and demonstrating the use of the technologies whilst learning about them. This can enable a strong link to be made between the theoretical training, and the processes involved in using hardware or performing tasks with software.
- Where physical disabilities are present, using ICT to train about ICT can enable trainers who have expertise in assistive technology and accessibility to suggest appropriate steps to help a student. By observation of a student striving to use ICT, the trainer will often observe the problems that a student is having and may be able to offer a way to help them to use the technology better for themselves. This could be through trying out or suggesting different assistive devices they may have available (for example a touchscreen, track ball or joystick instead of a mouse, or a large key or on-screen keyboard), setting up the operating system to work better with the way a student uses their input devices (for example changing pointer and click speeds, use of sticky keys and

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other assistive keyboard modes, use of a text-to-speech package, or by adjusting the display mode). Where these methods are employed by the trainer for the student, the trainer can work with the student and focus on getting the settings right for the student, who once able to interact with the computer more easily will be able to progress with further learning at an increased rate.