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Project DYS2GO: Learning games for Dyslexic young adults

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GENERAL EVALUATION REPORT

2021

Partners:

LATVIAN UNIVERSITY - LATVIA

ASOCIACIA DYSLEXIA – BULGARIA

EUROFACE CONSULTING S.R.O. – CZECH REPUBLIC

E-LEARNING CONCEPTS – AUSTRIA

GEDONSOFT GMBH – GERMANY

SOCIALINIU PROJEKTU INSTITUTAS - LITHUANIA

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INTRODUCTION

The game has always occupied an important place in the lives of people from an early age and throughout their lives. The game in its huge variety is a means of exploring the world, mastering skills, establishing relationships and learning different role models.

Child development specialists believe that playing games is critical to the mental, physical, and emotional development of each child: the game is not only joy and fun; through it children develop their personality, the positive attitude towards themselves and realize their potential.

With the time and the age games, of course change, but their role in human's life doesn't lose its importance. Game-based learning has shifted focus from learning with lectures and written tasks to learning with games and it has become an indispensable part of modern education.

Using games as an element of the learning process provides opportunity to create a safe atmosphere for acquisition of new skills, or improving those that are not well enough developed; for trying new situations without fear of failure.

The practice shows that the knowledge and skills acquired through game-based learning are retained longer than information from other learning methods. The reason that game-based learning often is more effective than the traditional (instruction-based learning) is that the learner, while playing, is fully involved in what he/she is doing. Of course, in order to make learning effective, it is necessary to offer the learners games that are well designed and have well implemented learning tasks. A well-designed educational game means that the learning objectives are properly combined with the fun. Games designed specifically for learning purpose can motivate self-learning and problem-solving skills to a great extent.

1. ABOUT THE PROJECT

Dyslexia, together with dysgraphia and dyscalculia form the group of developmental disabilities known as Specific Learning Disabilities (SLD). The main characteristic of these difficulties is that they are “specific”, that is, they affect a specific range of abilities in a significant but selective way, leaving intact the general intellectual functioning. SLD have a major impact both at the individual and at the social level. They frequently lead to a lowering of academic performance and/or early dropping out of secondary school, and they reduce the potential in social and work environments.

Dyslexia affects 1 in 10 persons around the world. Most people reduce dyslexia to just a reading and writing difficulty. But dyslexia is a multi-faceted problem that effects not only literacy acquisition, but also the way information is processed, stored and retrieved, with problems of memory, speed of processing, time perception, organisation and sequencing. Dyslexia is a lifelong condition; it doesn’t go away after finishing school; it affects all parts of one’s life.

A dyslexic person needs to train his or her perception skills on a regular base, otherwise all measures of the inclusive education, for example, in VET, higher education or adult continuing training may fail. Such training is a prerequisite for phonological and orthographic processing. Inclusive learning requires accessibility of individual learning resources (for example, digital learning tools tailored to general or specific learning needs) to learn in a variety of ways that compensate deficiencies. Interactive exercises can help dyslexic persons to train specific skills.

Two successful projects (under Lifelong Learning - Grundtvig program) - EDYSGATE (2008) and DYS 2 (2011), tackled this challenge by providing learning games for dyslexic youngsters on the Window platform. The learning games developed within those projects won 2009 the Austrian Multimedia Prix (category social service) and the World Summit Award 2009 (category E-Learning/Education). The fact that the games developed within the two projects mentioned above were very well accepted by young adults with dyslexia and got a lot of positive feedback from this target group, but also from teachers/tutors who work with dyslexic youngsters has proven the importance

and necessity of such a tool. The technologies have been changing very fast during the last decade. Mobile devices have indeed become immensely powerful (not only from a technical point of view) and popular especially with young adults and offer huge opportunities for learning "anywhere and anytime". Which means - there is a growing request for a mobile version of such games. Here is where the new project DYS2GO came to place with the main objective to develop a new set of learning games that are available offline (once the app is downloaded, an internet connection is not required anymore), the user interface is adapted to smaller screens (for smartphones, iPhones, tablets), touch screen features are supported, etc.

These new applications, providing users with the ability to choose the time and place of the "training" itself, its duration, and the level of complexity of the game task creates prerequisites for greater freedom and privacy.

Studies have shown that people with dyslexia have certain deficits in one or more of these following areas: perceptions, memory, attention, spatial orientation, sequence handling. That is why the focus in the suggested games is on these seven key areas that are known to be a weak point for many dyslexic individuals.

2. QUALITY MANAGEMENT - PARTNERSHIP EVALUATION

During the whole project period the situation within the Partnership was carefully monitored regarding:

1/ the overall organization and management of the project activities;

2/ the communication between the partners and the coordinator, as well as between the partners and the leading partner of the respective Output;

3/ the collaboration between partners;

4/ the mutual support in the development of the project products and their testing and implementation;

5/ the atmosphere within the Partnership – the level of tolerance and understanding.

As it can be seen from the results of the Final Partnership Evaluation Questionnaire, displayed below, all partners evaluated all aspects of their

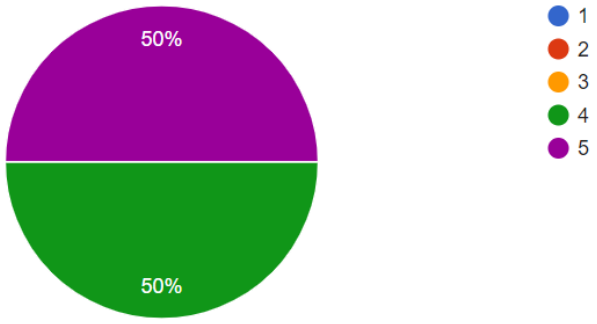
communication and collaboration during the project period very high. They have expressed their satisfaction of the opportunity to work together on the realization of DYS2GO project. The degree of achievement the aims and objectives of the project the partners rated 4.5 out of 5, admitting that the mutual support was of a great importance (4.75 out of 5), as well as the tolerance, freedom of expression and the respect of different views (4.83 out of 5).

The Evaluation Questionnaire was answered by 12 representatives of the 6 partner institutions, and 75% of them declared that they are satisfied by the project results and developed products (DYS2GO learning games); the rest 25% are very satisfied.

Results of the Final Partnership Evaluation Questionnaire in diagrams:

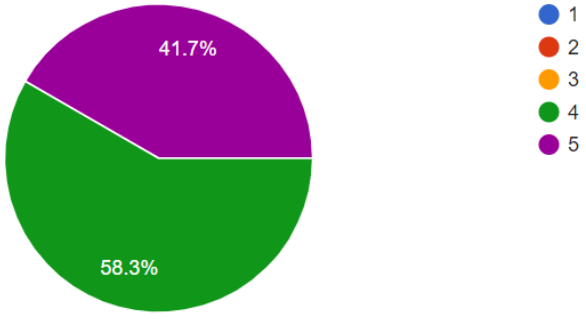
1. To what degree have been achieved the aims and objectives of the project? (1 - the lowest; 5 - the highest)

12 responses



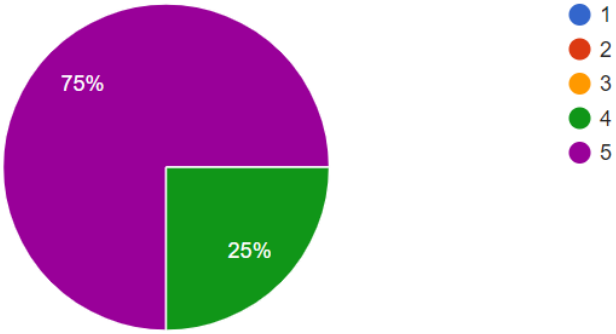
2. How would you rate the overall organisation and management of the project activities? (1 - the lowest; 5 - the highest)

12 responses



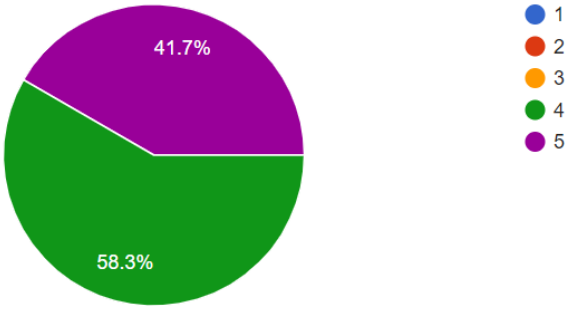
3. How would you rate the communication between partners during the whole project period? (1 - the lowest; 5 - the highest)

12 responses



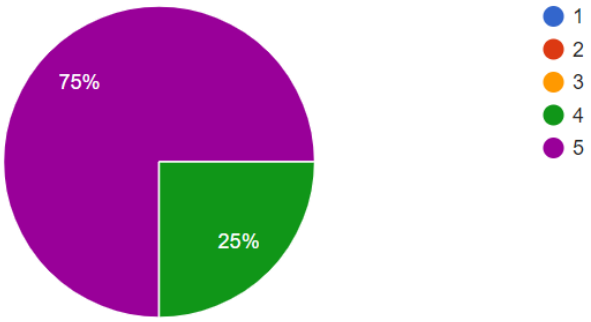
4. How would yoo rate the collaboration between partners during the whole project period? (1 - the lowest; 5 - the highest)

12 responses



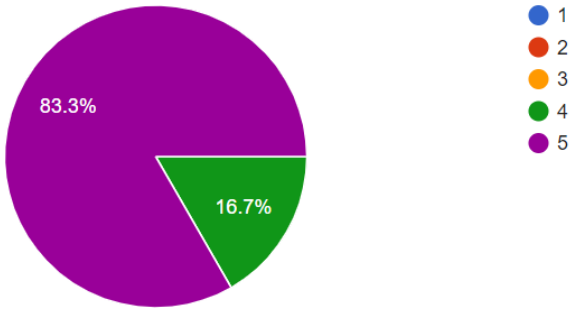
5. How would you rate the extent to which there was mutual support between the partners? (1 - the lowest; 5 - the highest)

12 responses



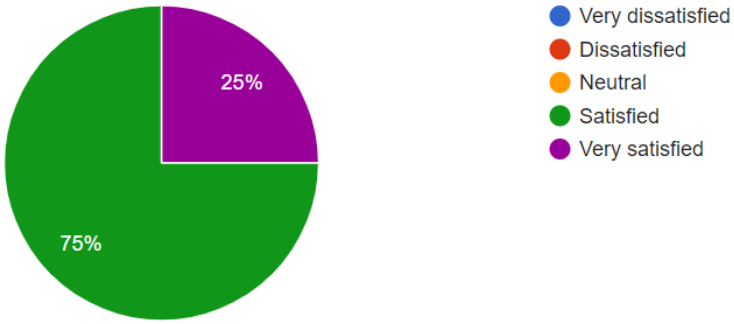
6. How would you rate the tolerance, freedom of expression and respect for views within the Partnership? (1 - the lowest; 5 - the highest)

12 responses



7. How satisfied you are with the results and the developed products (DYS2GO learning games)?

12 responses



3. QUALITY MANAGEMENT – GAMES EVALUATION RPOCEDURE

The evaluation of the Dys2Go learning games was realized in four stages:

Phase 1: Internal Testing of the games by partners (project teams). The main aims of this testing were:

- to find out if the games are technically ready – Bug reports were regularly sent to the Programmers (GedonSoft) after each new/updated version of the games was delivered;
- to find out If the instructions are clear enough;

- to ensure that simple language (no too long sentences) were used;
- to check if all functions work properly, etc.

Phase 2: Testing by the user group(s) and evaluation – to participate in this phase of testing were invited dyslexic learners (young adults) and their teachers/tutors/trainers

Phase 2 of Testing was realized between 15th December 2020 – 22nd January 2021. Partners agreed that the minimum number of users to be involved in the testing/evaluation would be at least 5 trainers and at least 20 young dyslexic adults per country (Austria and Germany acting together as both partners are testing the German version of the App). Evaluation Questionnaire for the purpose of the Evaluation was developed for teachers and for learners. The main aims of the Questionnaire were:

- To learn the overall opinion of the users regarding Dys2Go games/storylines;
- To evaluate the games from technical point of view (design, user face, functioning, etc.)
- To analyze opportunities for further use of the game as part of the teaching and self-training.
- To collect and analyze users' feedback on positives and negatives of the App, as well as their suggestions for improving the application before delivering it for wide use.

Phase 3: Based on the feedback collected from the user groups, with data, conclusions and recommendations, each partner prepared National Evaluation report. All national reports were sent to the leading this activity partner (DABG) by 1st February 2021.

Phase 4: General Evaluation Report – prepared by DABG (by 15th February 2021) based on the information from National evaluation reports – data, conclusions, recommendations for improvement of the app. During this phase DABG contacted individually the respective partner when any further information or clarification was needed.

4. INTERNAL TESTING

4.1. The Process

The main target group that DYS2GO learning games address are young dyslexic adults (16+). They will benefit from the new knowledge and experience they will gain, but also the new tools (games developed the way to best match their specific needs) will help them to develop new skills so important in their efforts to overcome the difficulties caused by dyslexia and to find a better realisation of their potential in all aspects of life. Mobile apps will enable dyslexic young adults to train from any location and at any time. The exercises allow individual and anonymous training of the persons concerned. Furthermore, DYS2GO games are designed to provide a highly motivating and stimulating learning environment for a carefully selected range of skills known to be important for young dyslexic adults, addressing the areas of particular importance for development of study skills. Plus, the principles behind the exercises are designed to be not-language dependent so they can be used by anybody who is interested and who needs such a training, no matter of his native language. Another option is to use DYS2GO games as part of the structured classroom/group activities, so they are a valuable tool for teachers, trainers, tutors and other specialists who work with dyslexic young adults.

Throughout the whole process of the development of the games all partners participated very actively in the discussions regarding the structure of the games, their content, as well as the functionality and the interface of the App.

At the kick off meeting (Vienna, December 2018) it was decided partners analyze all the old games (from EDYSGATE and DYS2 projects) and evaluate them from the applicability to the new requirements point of view. This in fact was the first step in the Internal evaluation process. Results of the pre-selection, done by partners, could be found on Slack (a separate file for each of the key areas). These results were a starting point for developing the new games.

At the second project meeting (Bremen, March 2019) while the partners were discussing the structure of the games, a new idea was born – to develop storylines, each of which will include several games from different areas. Partners chose different topics: Archaeology (Bulgaria), Crime (Austria), Travelling (Latvia), Shopping (Czech Republic), Leisure time (Lithuania). During the next few months, partners developed the concepts of their storylines and presented them to the partners for evaluation and discussion. When the structure of the storylines was agreed, the partners started to work on the detailed development of the content and preparation of the media files (firstly in English, then on the national versions).

First demo version of the first storyline – Archaeologist (later the title was changed to "Lost in the Pyramid") was provided for testing by partners in November 2019.

The decision to create storylines along with the index games was very good (what was proved by users' feedback during the Evaluation stage), but made the process of programming more difficult and slowed it down. That is why the first "full" (all storylines and index games in all languages) was ready for internal testing only in April 2020.

During the whole testing period (since November 2019 until December 2020) team members from all partner countries tested the games. Their task was to check the games' functionality, user interface, and accessibility for dyslexic learners. All bugs have been regularly reported in the bug reports as well as in e-mails. Teams worked together with the German partner (responsible for programming) for solving all problems related to the respective storyline and index games. The reported bugs were steadily corrected, periodically new versions for testing were provided and with the time the app was becoming more and more usable for the end users.

The app was initially tested by 3 people from GedonSoft GmbH (the German partner, responsible for programming) before delivering each updated version for testing by other partners. At the last stage (November and December 2020) all games and storylines were tested by 4 employees. The app has been tested on various Android and iOS devices (smartphones and tablets)

In Latvia three project employees were involved in the internal testing, as well as one expert from IT industry with special education background.

In Bulgaria four team members were involved in the whole testing process; two of them being young people themselves (23-25 years old), could provide opinion on the relevance of the games/interface for the target age group.

From Euroface (Czech Republic) side also four people were engaged with the testing, two of them – since the beginning.

Two persons from the ELC (Austria) were involved in the internal testing of DYS2GO games. Additionally, external experts were involved at different implementation stages: Spela Jurak (trainer), Mario Engel (head of Dyslexia association), youngsters of the YEP organization (YEP - youth organization and a social enterprise) as well as design and video specialists E.Kaziz-Hitz and W.Tesar.

In Lithuania two SPI employees were involved in the internal testing of DYS2GO apps and educational games; one of them has an IT background, another is a dyslexia specialist.

4.2. Main problems, reported by partners during the development stage of the games:

Looking back, it can be stated that the partnership was too optimistic about the it`s time resources to create five storylines along with the index games. The project proposal did not plan the stories, only the games / index was planned. The process of programming and testing was very time consuming, complex and difficult to manage. The programming resources were too restricted. The corona situation added additional difficulties e.g. with respect to face-to-face meetings, getting trainers and youngsters on board for evaluations.

Anyway, the decision to create storylines along with the index games was very good (what was proved by users' feedback), but made the process of programming more difficult and slowed it down. Not everything was settled in methodology at the beginning of the creation of the storylines and later it brought some problems. Storylines do not have the same structure (do not

mean content/topic of the storylines) – a size of the storylines is different, some types of games are prevailing (memory games), etc. But on the other hand the storylines are unique and games themselves suitably fit into the line of the stories. As whole, this effort was worth it - according to the evaluation 'feedback – target groups like the idea of the storylines and its topic such as pyramid, detective plot etc.

Bug testing was not provided in a very effective way. Although the first demo version (of the Egypt storyline) was provided in November 2019, in fact the first "full" (all storylines) testing version was ready only in April 2020. After that a lot of testing versions were delivered, but many of the bugs reported with one version stayed unaddressed properly in the next versions, which made the process of the internal testing not very productive. It was a good decision to start solving the bugs in the storylines one by one, at first in the English and the original language version, and then in all other language versions.

Another problem (which has not been completely solved by the time of the evaluation stage) is the long time required for downloading the App. One of the reasons is the "heaviness" of the App; the time depends also on the quality of the internet connection. The project team is trying to find solution for this problem as it is mentioned as the main problem by the end users who participated in the testing/evaluation, too.

Despite off all difficulties, the partnership found ways to adapt to the new situation and to achieve good results, providing a good quality product.

4.3. Expectation/satisfaction with results:

DYS2GO games were planned and developed as a tool to train and improve some of the key skills known to be important for dyslexic learners: memory (auditory and visual), sequencing, spatial orientation, attention, etc. It can be very useful for youngsters, especially during the periods of distant education. The fact that the app was developed in different versions and can be used both on PC and on mobile devices enable young people to train from any location and at any time. This fact suggests the possibility the games to be used both as a self-training tool and as a part of the learning process in the classroom. Good

option is the opportunity to choose between single (index) games and storylines, also choosing different levels of difficulty. Tracking the results is a motivating feature, as encourage learners to come back and play the games again trying to improve their previous result.

Different language versions bring an additional value. Especially useful are found English and German versions (these two languages are widely taught in most of the schools in partner countries), because they could be used with all students (not only with dyslexic ones) as a useful tool in foreign language teaching and learning.

Taking into account the big variety of the games in all key areas, storylines, opportunity to choose different levels of difficulty, availability of different language versions, quality of the design and – of course, some difficulties and negatives, mentioned above, as whole the partners are of the opinion that the developed product (DYS2GO learning games) is of very good quality and meets the pre-set parameters and pedagogical goals. In addition to what was planned initially (in the Proposal) five storylines were developed with dozens of individual games included in each of them with different levels of difficulty. And if even the development of the storylines added some difficulties for partners in the development and testing stages, it was worth the effort.

5. RECRUITMENT OF PARTICIPANTS

In order to attract more participants for the Testing and Evaluation from the target groups, partners made necessary steps to widely spread information about the project and DYS2GO App.

In Latvia there was one dissemination event for 32 speech and language therapists held on 16th of October, 2020. Theoretical background of games and topicalities of dyslexia were followed by practical demonstration of the games as well as app testing on Android devices. The recruitment of the participants was held personally. Project team members called educators by phone and supervised the download and installation of the games; a link to the project

website with instructions how different versions of the App can be downloaded was published on the Faculty website, too.

Bulgarian partner – Asociacia Dyslexia – Bulgaria, used different channels to reach the target groups to provoke their interest and to encourage them to take part in the testing of the application. Information about the project with link to the project website, where the app could be downloaded from was published on DABG website (www.dyslexia-bg.org) and Facebook page and teachers and youngsters were invited to take part in testing and evaluation. Team members contacted personally teachers who have participated in previous activities organised by DABG (via phone mainly). To take part were invited also teachers who participated in the two multiplier events organised by DABG in 2019 and 2020 within the frame of DYS2GO project and who have expressed interest to be involved in the process. Contacts with students were made via teachers; some young people DABG specialists have been working with through the years were also personally invited.

In the Czech Republic teachers and SEN specialists were contacted personally via phone calls, meetings and presentations. Some pedagogical centres were reached and their staff was invited to take part in the testing of the games. Team members from Euroface contacted the Czech Dyslexia Association for further recruitment of youngsters. Emails with invitation were sent to schools and special education centers Euroface collaborates with. Information about the project with a link to the project website where the App can be downloaded from was published on Euroface´ website and social media.

In Austria and Germany, who organized the testing collaboratively, as in both countries the German version was tested, the recruitment was held via LinkedIn and Facebook, where posts were placed from November 2020 to January 2021. The posts were shared by the Austrian and German dyslexia associations as well as several single trainers. The youngsters were reached via the trainers and via YEP. Approximately 80 teachers and trainers were informed personally by email and asked to take part in the evaluation of the Dys2Go APP. Some institutes and school facilities were also tried to contact by phone, but with little success due to the corona pandemic restrictions and the resulting of school closings.

Lithuanian partner - Socialiniu Projektu Institutas, sent invitation to participate in testing by e-mails personally, by phone calls and messenger personally as well. Team members contacted educators and specialists (speech therapists, special educators, psychologists), who participated in multiplier events. In addition, the e-mails were sent to other interested persons. The invitation for testing was sent to more than 80 educators and specialists. In addition, SPI provided the installation guides and supervised the download and installation of the application if there was a need from educators/specialists' side. A multiplier event, held on 15th October 2020 in Jonava, Lithuania for 26 speech therapists and educators was also used to present the theoretical background of DYS2GO games and topicalities of dyslexia, and to demonstrate in practice the games and to test the app on Windows devices.

6. NUMBER OF PARTICIPANTS

Thanks to the well-organised recruitment process and despite of the difficult situation due to the COVID-19 restrictions in all partner countries, the number of teachers and learners who took part in the testing of the application exceed the pre-set numbers by 160% (for teachers) and 20% (for youngsters)., which partners consider to be a very good result.

In different countries the number of teachers/trainers/tutors and youngsters (learners) who took part in the testing and evaluation is different, but all partners achieved the numbers agreed before. Altogether in the testing and evaluation were involved 225 users: 77 educators and 147 learners.

Numbers per country are shown in the table below:

	Latvia	Bulgaria	Czech Republic	Austria & Germany	Lithuania	Altogether
Teachers	31	14	6	21	5	77

Learners	21	55	20	25	26	147
Users per country	53	69	26	46	31	224

As the links to the online questionnaires remain open, it can be expected that more feedback will be provided during the next weeks.

7. ORGANISATION OF THE TESTING AND EVALUATION

There was no internal regulation how to organize the testing of the application (and it was impossible due to the quickly changing situation and different restrictions in the partner countries because of COVID-19 and). Each partner was responsible to find the best way to involve the participants in the process, to provide the needed support and to collect users' feedback.

In Latvia the evaluation was done by teachers and students at their own, project employees weren't together with students or teachers. Members of the project team supported teachers during installation process and instructed teachers how to give the feedback for games not working as expected. Teachers and students used their Android, Windows and iOS devices. iOS devices were not so popular as it 's installation process was a bit confusing for people that are just users. Teachers dedicated one to two lessons to students where at the first lesson they installed and played game together but in the second lesson – filled in the report.

In Bulgaria the testing with teachers and students started in the mid of November (with just one teacher and one student). The serious testing started on 18th December 2020 and continued until 29th January 2021.

Most of the testing with users (teachers and students) was done face-to-face. In accordance with the restrictions imposed due to the emergency epidemiological situation because of COVID-19, testing sessions were organised individually with each user in the office of the Association. At first users were presented the Guide, the structure of the games was explained as well as the

pedagogical goals of the games. Separately were presented the storylines and the index games in all seven areas. Each participant in the testing/evaluation was instructed and supported during the installation process. Each user spent between 2 and 4 hours playing games under monitoring of a team member, who support her/him through the process, gave additional explanations when needed and answers all the questions. During face-to-face sessions users played on DABG laptops (Windows version) and/or on their smartphones (Android version) and iPhones (iOS version). At the end of the face-to-face session all users were asked to play more games at home for at least one week and then to fill in the evaluation questionnaire. For those participants who were from different places, online sessions were organised, to present the games, and to support them with installation and downloading. Then they played the games and storylines by their own and gave feedback filling evaluation questionnaire.

The Czech partner – Euroface, combined personal and distant testing for both target groups (teachers and learners). Teachers involved in face-to-face testing used Euroface's devices (laptops and phones). DYS2GO app and the Guide for teachers were introduced, as well as the structure of games (storylines/index games) and levels. Students used their own devices in case of phones (Android), Windows version has been tested on laptops. Evaluation form was fill-in in a spot. For the remote testing, help assistance in installation the DYS2GO app was provided via phone when necessary, which was in most cases, otherwise the testers would give it up, because of the slowness of the process. Feedback from distant testing (phone talks and filled-in questionnaires) was provided within 1-5 days.

Austrian and German partners organized the testing together as in the both countries the German version of the App was tested. The testing was done by teachers/ trainers and youngsters on their own. Because both countries were under hard lockdown due to the COVID-19 and no personal face-to-face contacts with users were possible, the project teams organized all the testing online. Participants in the testing preferred to use Windows and Android versions. Only one person used all three versions (Windows, Android, IOS). The IOS version was not easy to handle for testing via an additional app (TestFlight).

In Lithuania due to the COVID-19, schools and higher education institutions are closed, so the testing and evaluation were done online. Educators/specialists and students who were involved in the evaluation process did the testing of the games at their own. They used their own devices for Android and Windows app testing. Some educators had two sessions with their students via their online lessons: first - for app installation, second - for testing and evaluation. Some educators/specialists and students did it on their own when they had free time for testing and evaluation. SPI employees supported educators/specialists during installation process. Some of the teachers/specialists asked for help during the installation, so the project team members provided phone/Zoom calls and via screen sharing supported them till the end of the App installation. Educators/specialists were also instructed how to give feedback for the games. Before starting the testing all prosper participants were sent an invitation letter with detailed games and app installation instructions and with the teachers' guide.

8. USERS' FEEDBACK

All partners used the same evaluation questionnaire, which gave the opportunity to summarise and analyse the results easier. Each partner used different way of collecting feedback, but the most preferred to prepare an online questionnaire, using GoogleForms or SurveyMonkey. There were two separate questionnaires, dedicated to teachers/trainers and learners (youngsters). The questions in both questionnaires were similar, which let partners to compare the results and the feedback collected from the two target groups.

In order to get more detailed feedback some partners interviewed some of the participants in the testing/evaluation by phone or using online tools.

Results of the Survey among teachers/trainers and learners in partner countries can be seen in the Annexes.

Below are presented summarized results in the two target groups.

8.1. Survey among teachers/specialists

In the Survey took part 77 teachers, trainers, other educational specialists from all partner countries.
Summarised results are shown on Fig.1

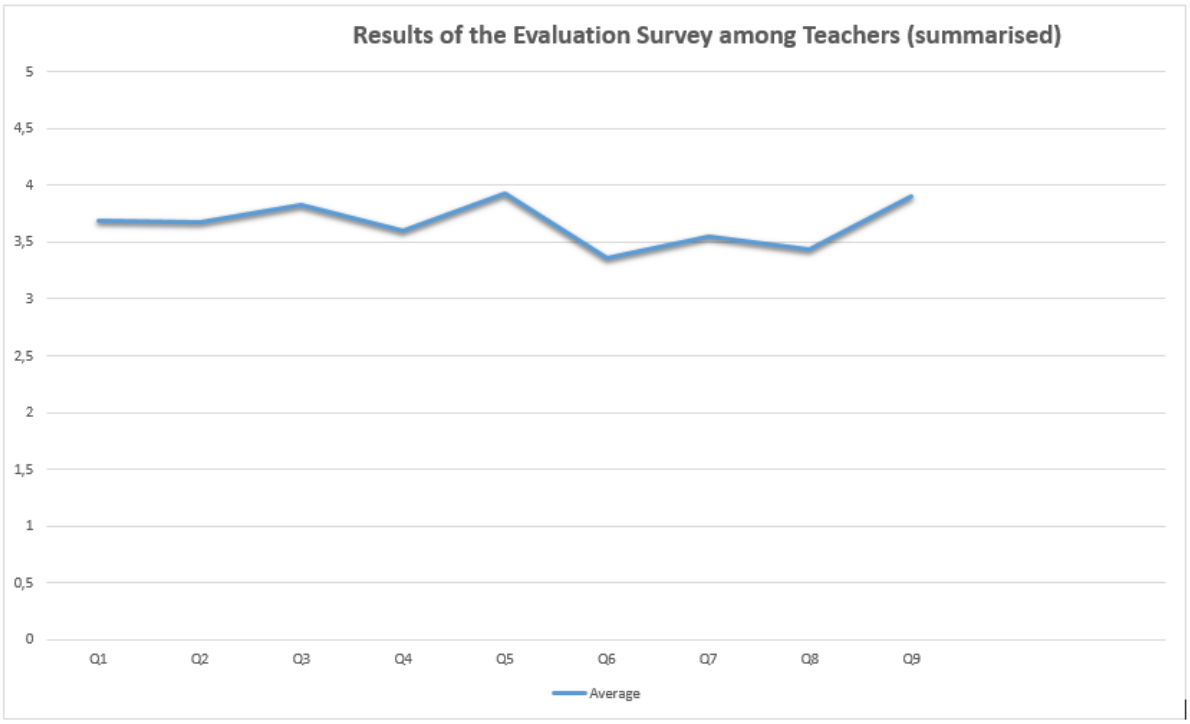


Fig.1: Summarised results of the Survey among teachers/trainers

As it can be seen from the graph, the teachers participating in the survey evaluated the usefulness and applicability of DYS2GO learning games (Q1) under the Dys2Go project as "good/very good". Most of the interviewed teachers share the opinion that games are a very good tool for youngsters with dyslexia and they would help them to improve their skills (Q3). Teachers plan to encourage their students to use the games at home as part of their self-training. The number of educators who answered “definitely yes” to the question Would they recommend DYS2GO games to their colleagues (Q9), is

also very high. As whole teachers' impression of the App is positive; they thing most of the games are interesting to dyslexic youngsters and answer their specific needs.

The number of teachers who played Windows version for testing and those who used Android version is approximately the same. Very few used the iOS version. What can be said, is that most of the teachers participated in the testing declared that they prefer the Windows version.

Distribution of teachers' answers to each question is shown on the graphs below (Fig.2 – Fig. 10). The lowest mark is 1, the highest – 5.

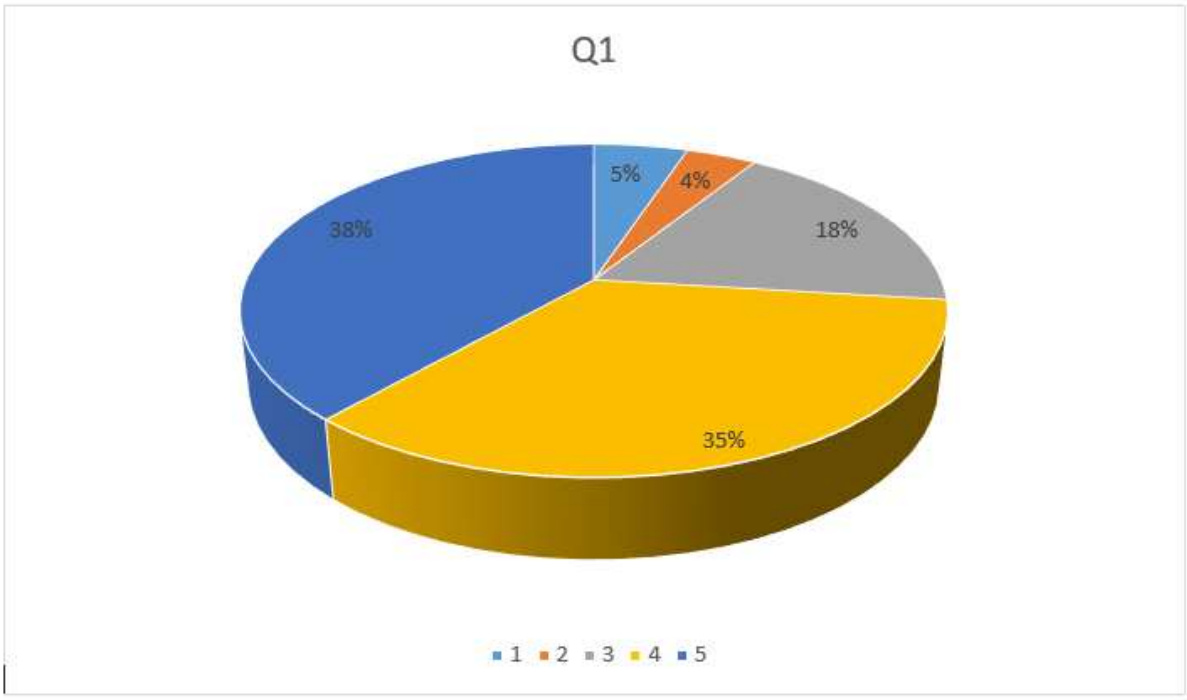


Fig.2: What is your overall impression of the Dys2Go learning games?

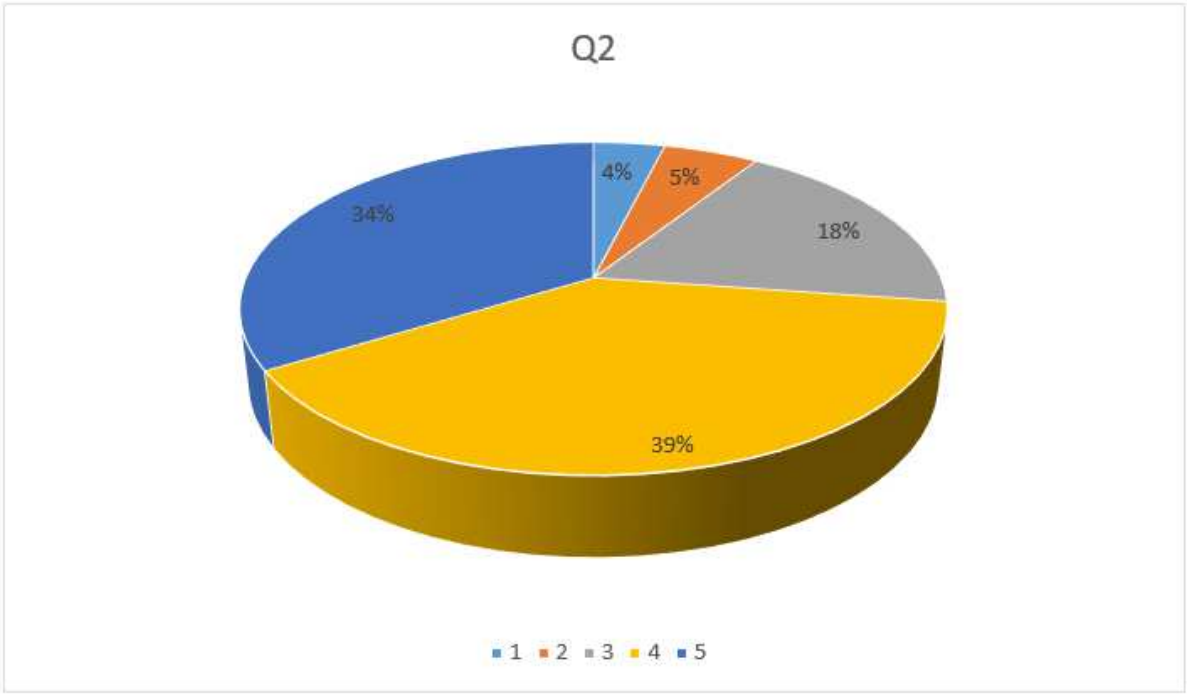


Fig.3: Would you use the Dys2Go learning games as part of your teaching?

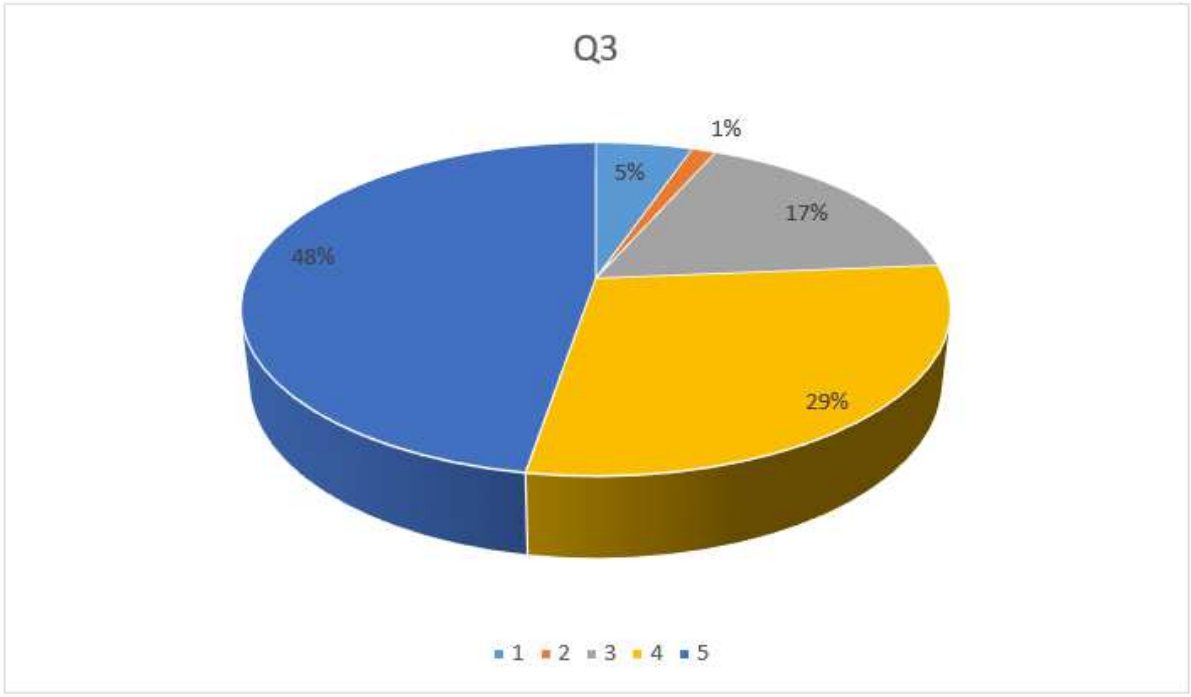


Fig.4: Do you think the Dys2Go learning games are an effective tool for improving the young dyslexic adults' skills?

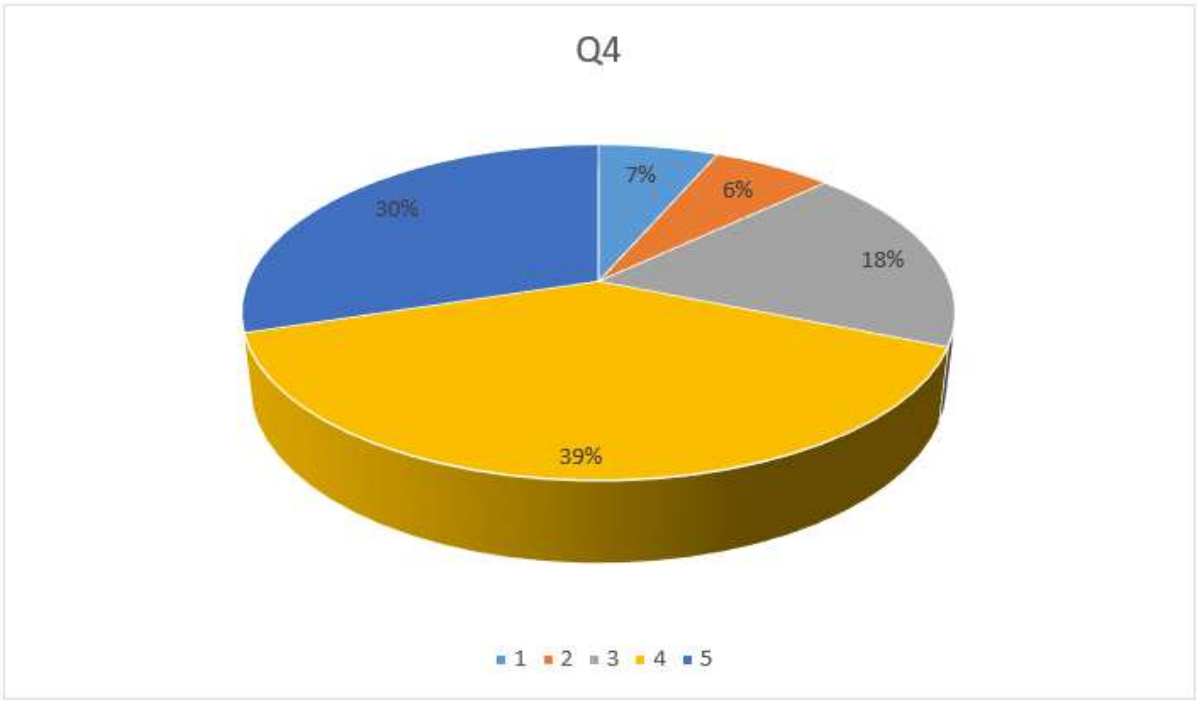


Fig.5: Do you think that the Dys2Go learning games are interesting to young dyslexic adults?

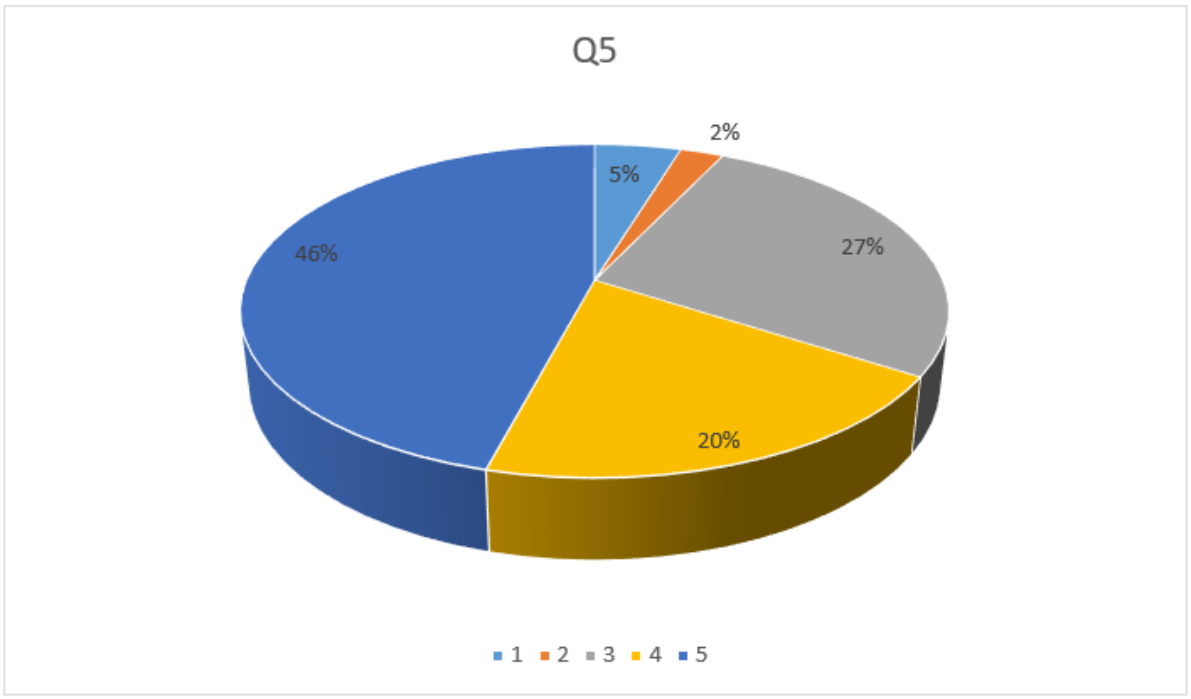


Fig.6: Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training?

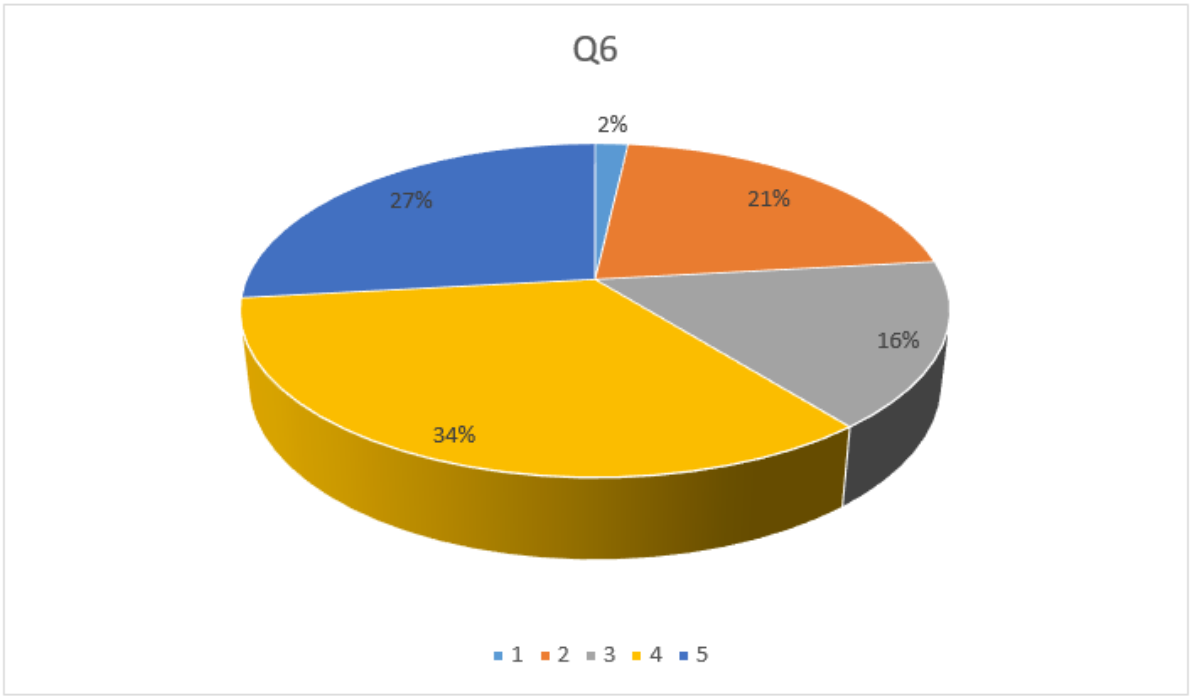


Fig.7: Do you think the Dys2Go learning games design appeals to young dyslexic adults?

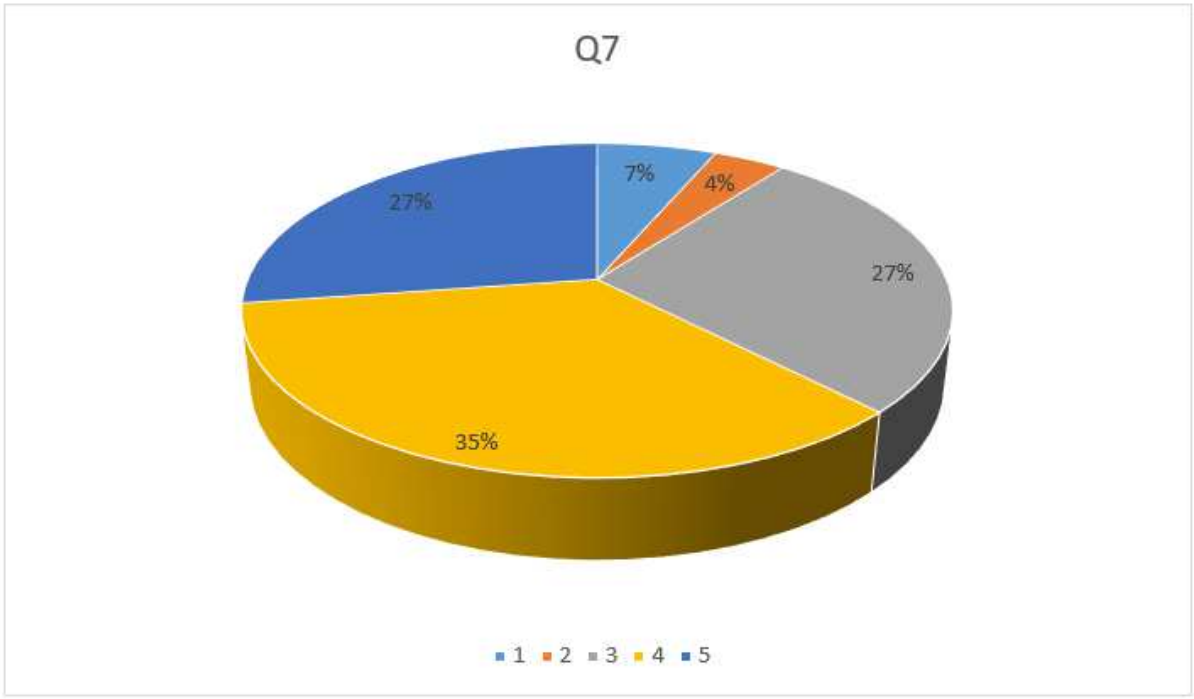


Fig.8: Do you think the user interface of the Dys2Go learning games complies with young dyslexics' specific needs and preferences?

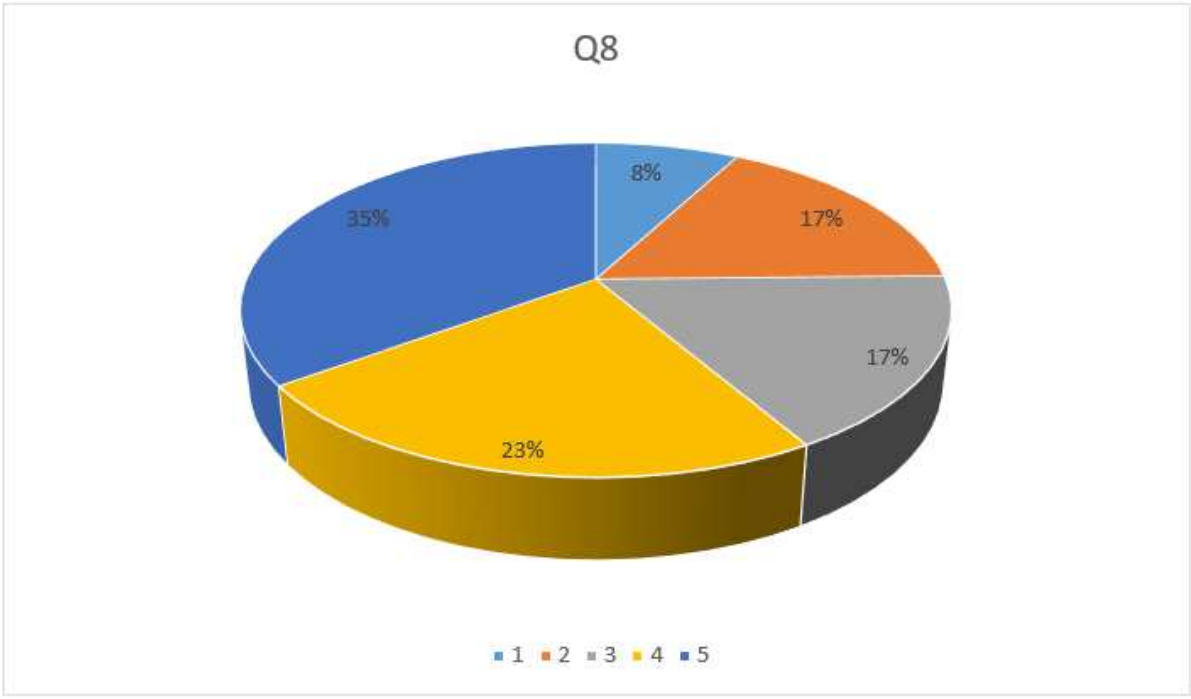


Fig.9: Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

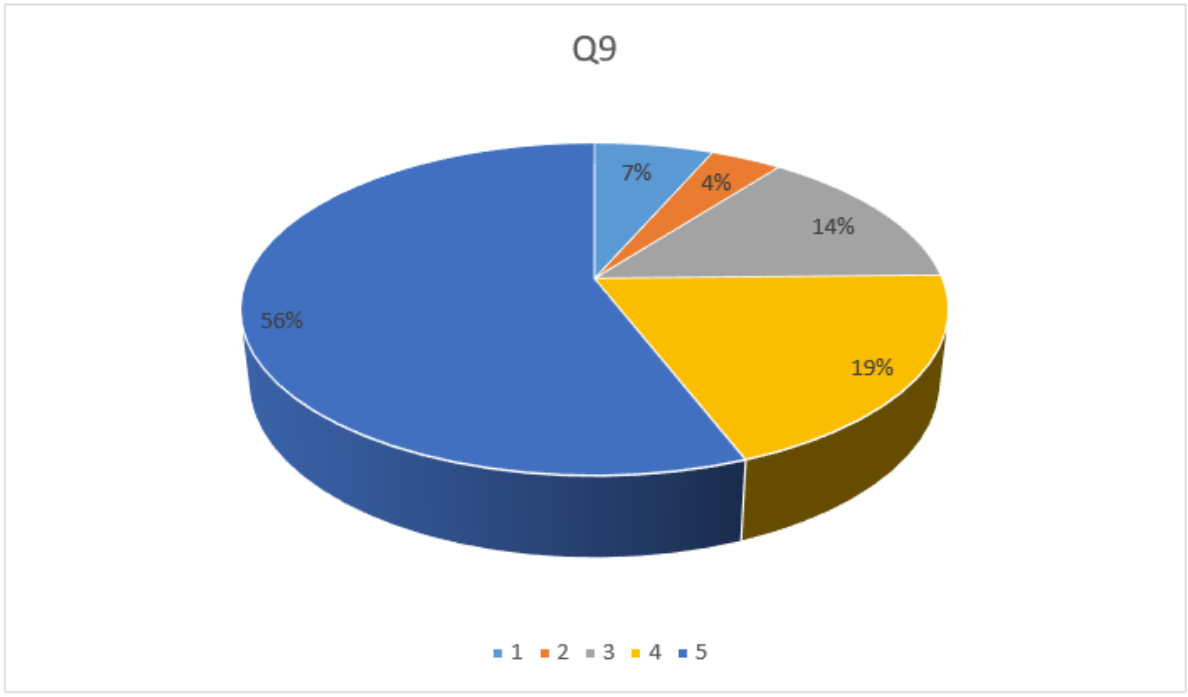


Fig.10: Would you recommend the Dys2Go learning games to your colleagues to be used with young dyslexic adults?

8.2. Survey among learners

In the Survey took part 147 young people (16+), mainly students from high schools and VET schools from all partner countries.
Summarised results are shown on Fig.11

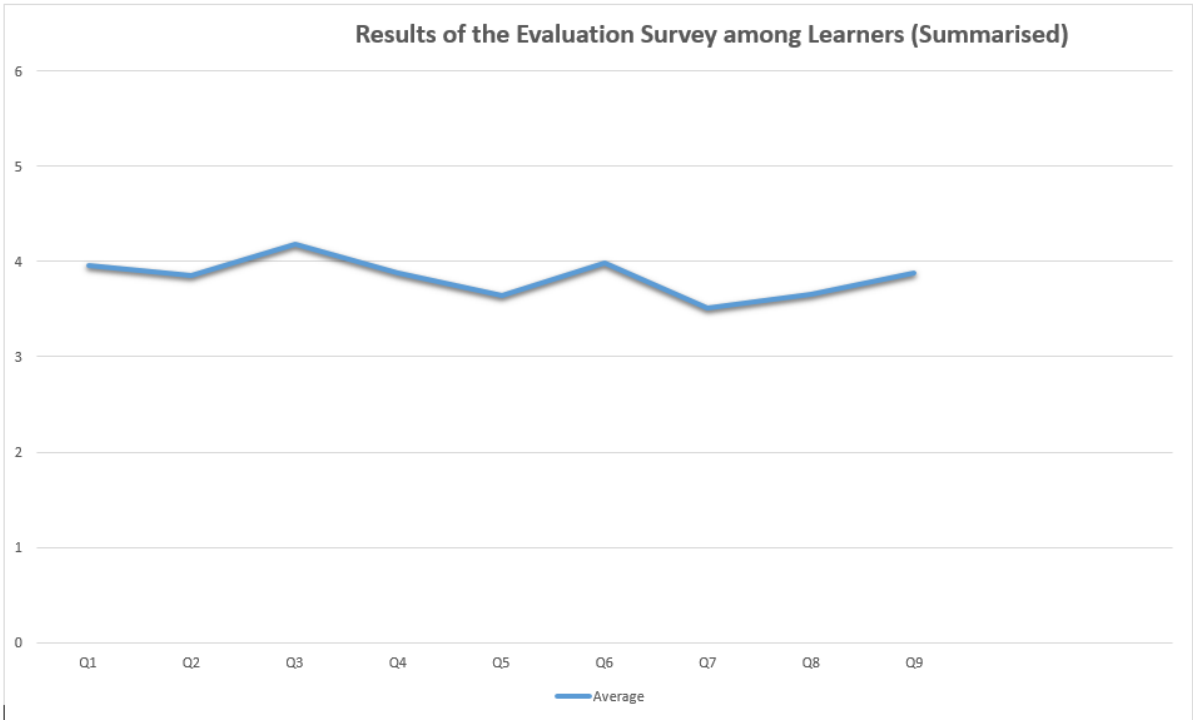


Fig.11: Summarised results of the Survey among learners

The young people who took part in the testing evaluated their overall impression of the developed DYS2GO learning games quite high (Q1), which means most of them like the games. The majority of students share the opinion

that they would like the educational games to be included as part of the classroom activities (Q3) – 4,18 points, which is the highest rated question. Learners said that most of the topics of the games and storylines are interesting for them (Q2) and largely meet their specific needs. 64% of respondents think that playing DYS2GO games will help them to improve their skills (Q4), although the percentage of those who plan to use the games as part of their self-training at home (Q5) is lower (56%).

Young people rated high the design of the games (42% as “very good” and 32% as “excellent”) – Q6.

Despite of some negatives pointed out by young users (mainly related to the long time necessary for installation and downloading of the App), most of them answered that they are more likely to recommend DYS2GO App to their friend and/or classmates or will definitely do so (respectively 26% and 38%).

The most of the learners participated in the testing declared that they prefer the Android version.

Distribution of learners’ answers to each question is shown on the graphs below (Fig.12 – Fig. 20). The lowest mark is 1, the highest – 5.

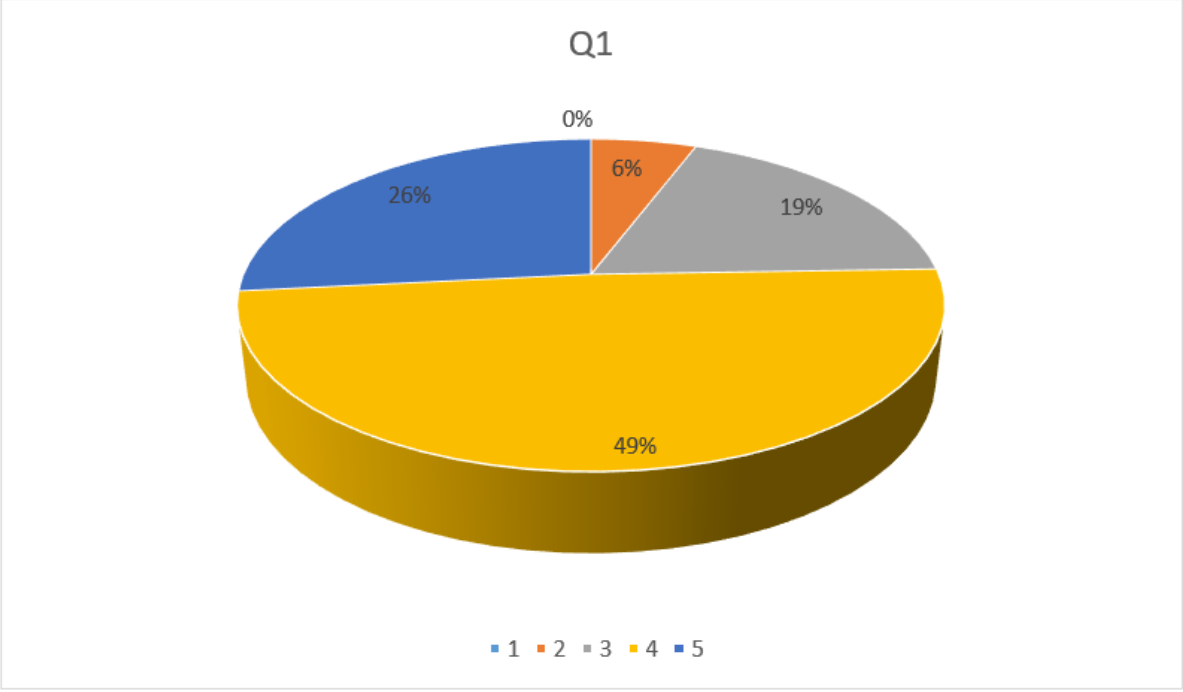


Fig.12: What is your overall impression of the Dys2Go learning games?

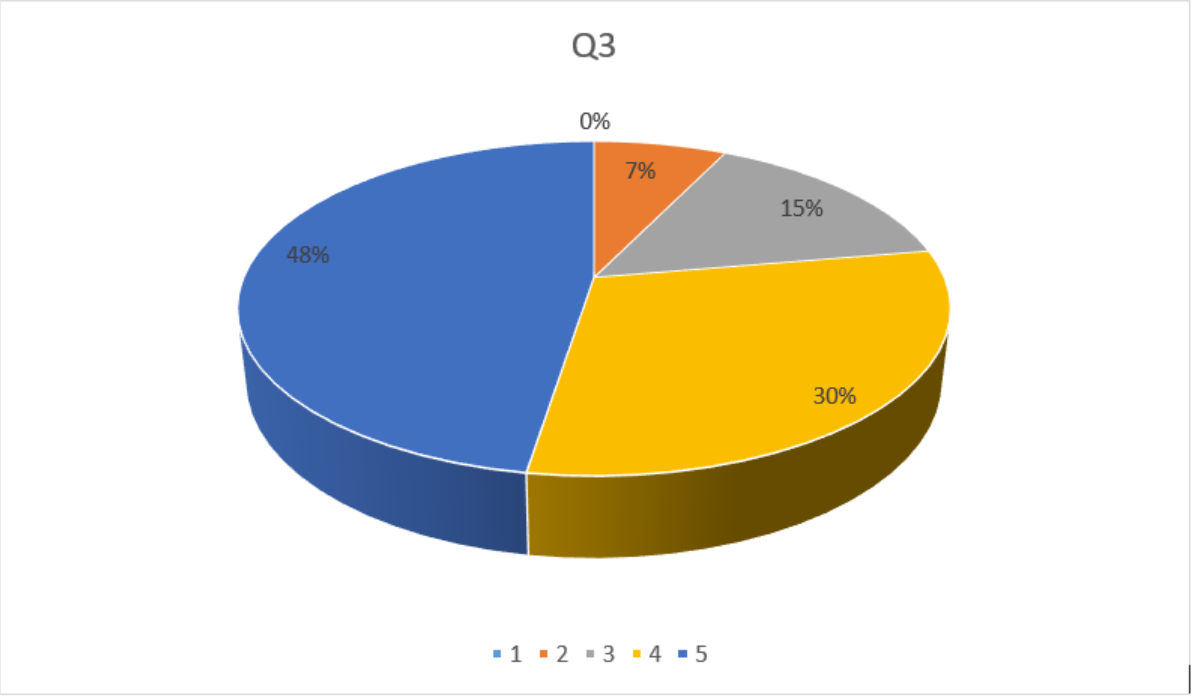


Fig.13: Would you like the Dys2Go learning games to be included by your teachers/trainers as part of their teaching?

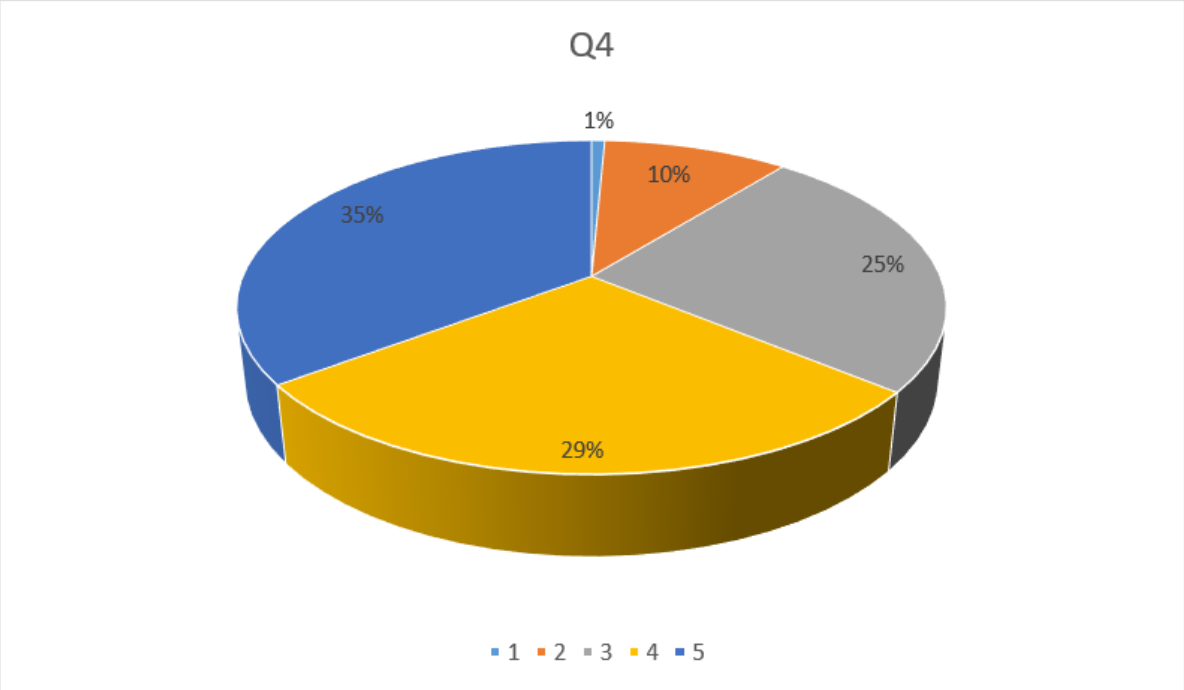


Fig.14: Do you think that playing the Dys2Go learning games will help you to improve your skills?

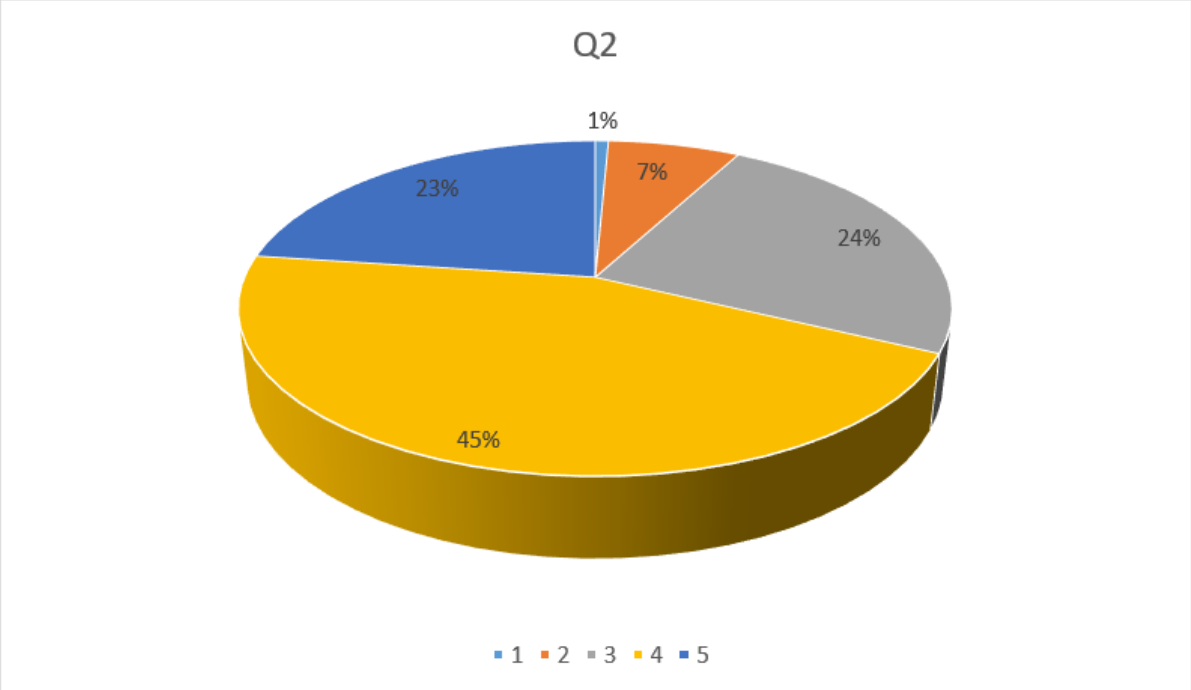


Fig.15: How interesting do you find the topics of the Dys2Go learning games and storylines?

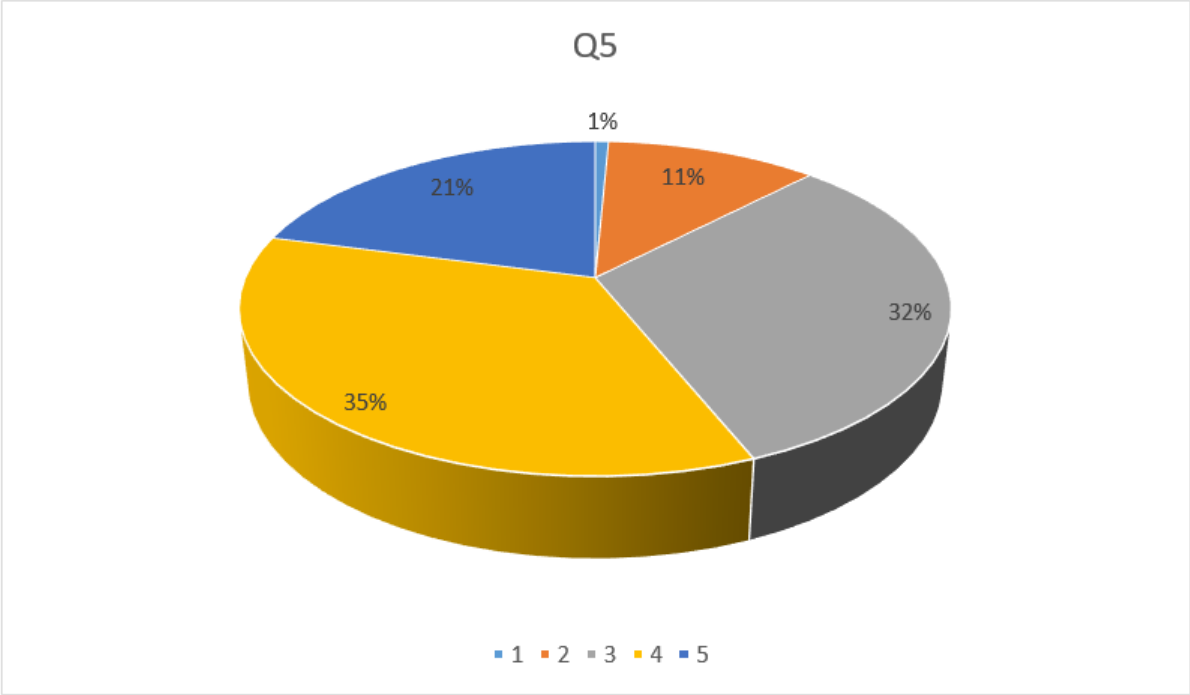


Fig.16: Would you use the Dys2Go learning games at home for self-training?

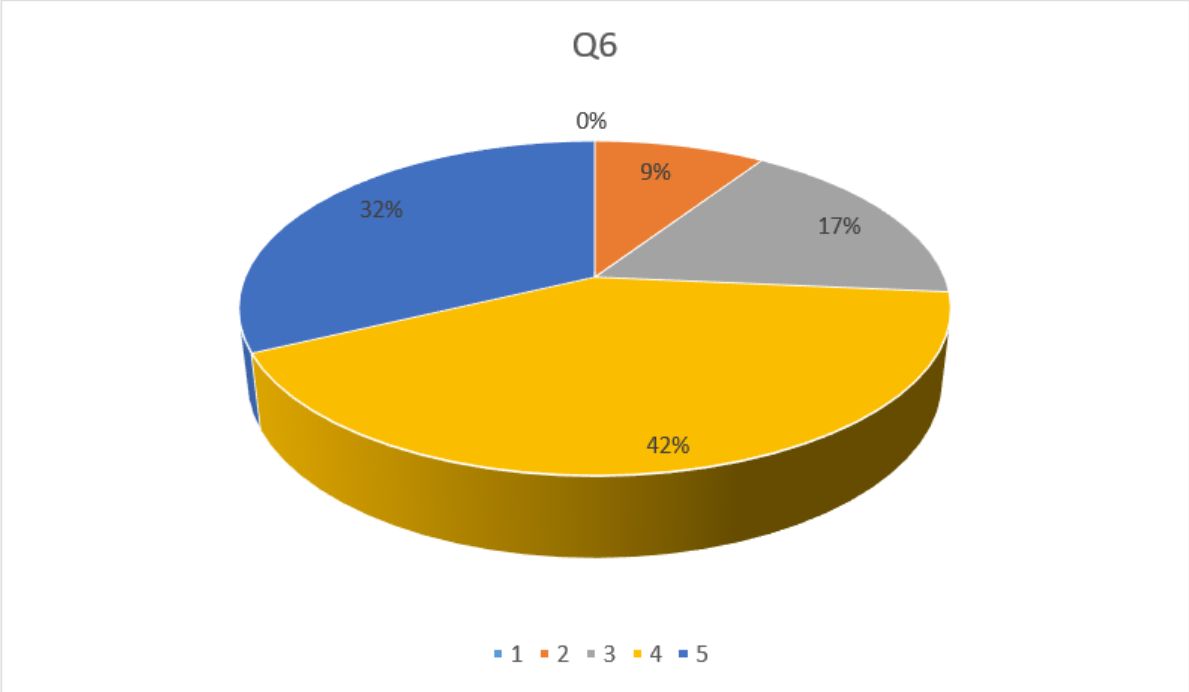


Fig.17: Do you like the Dys2Go learning games design?

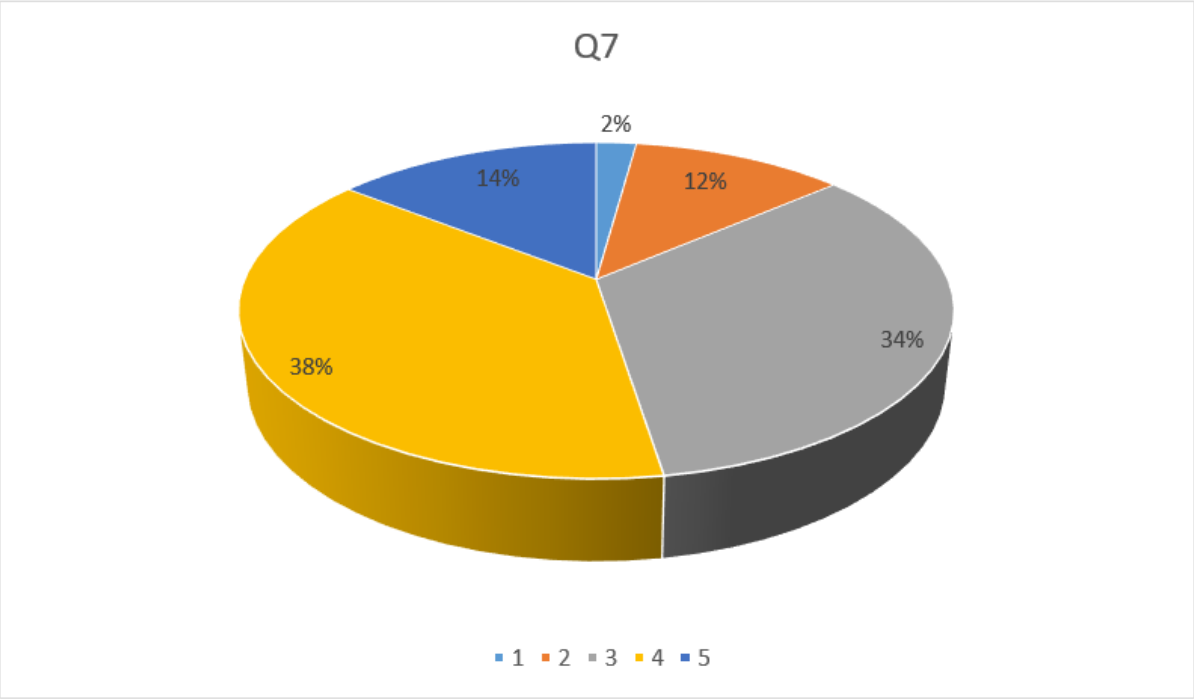


Fig.18: Do you think the user interface of the Dys2Go learning games complies with your specific needs and preferences?

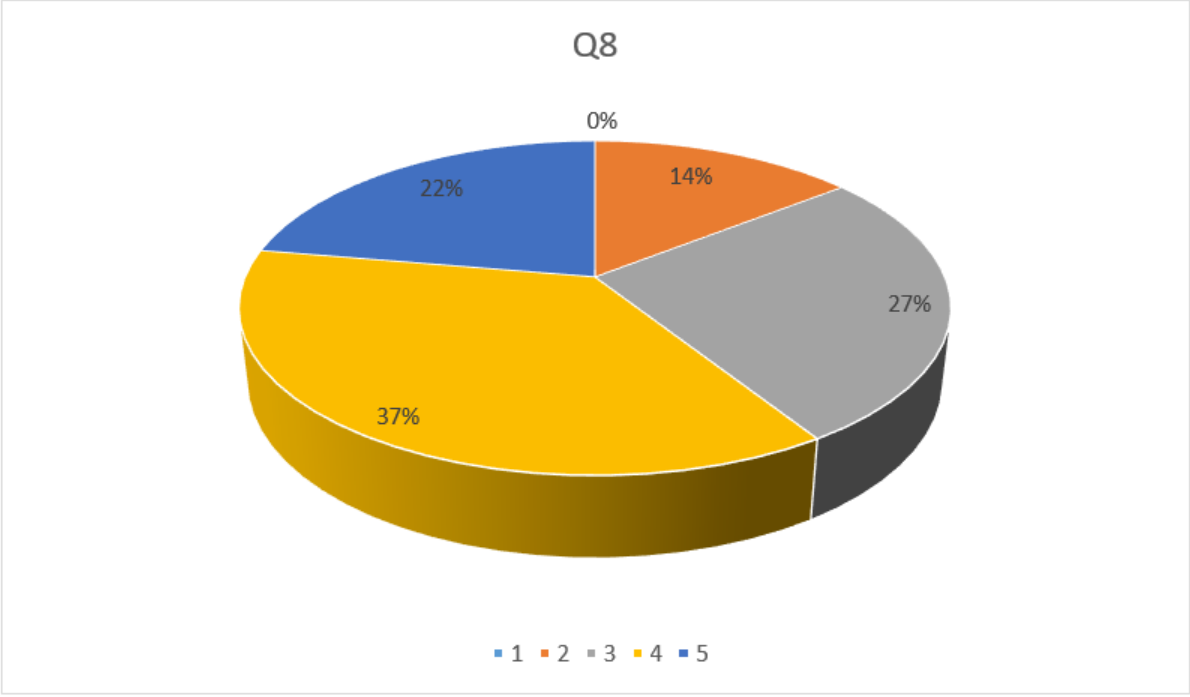


Fig.19: Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

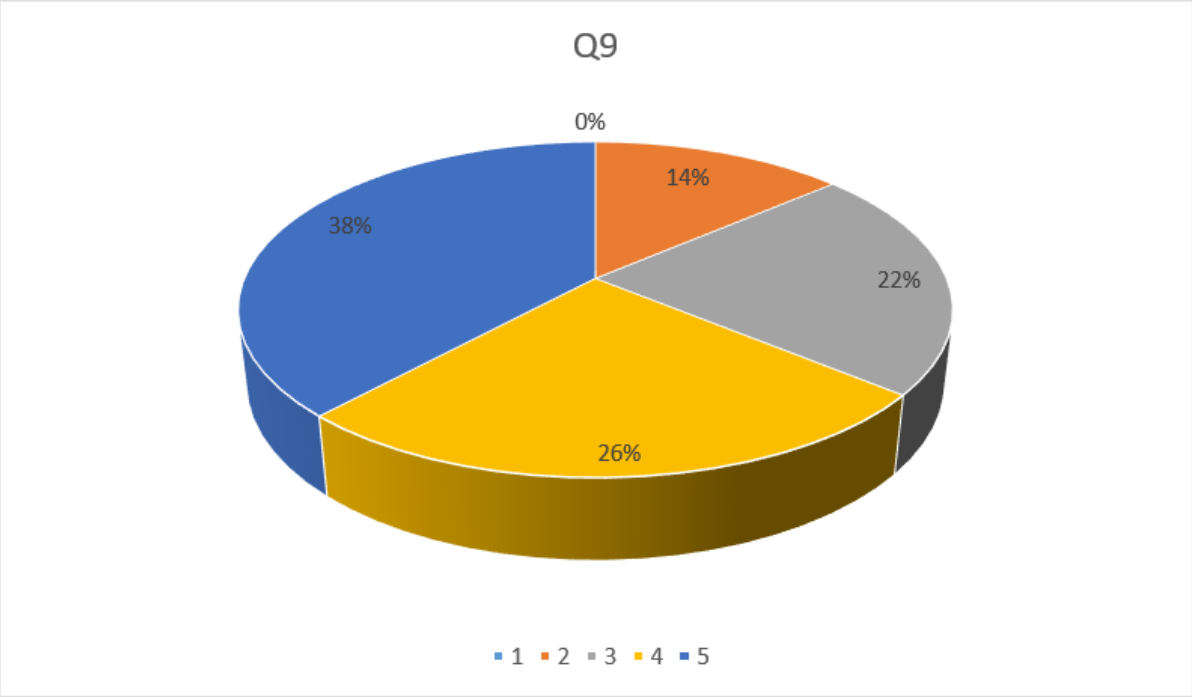


Fig.20: Would you recommend the Dys2Go learning games to your friends and other young dyslexic adults?

On the Fig.21 can be seen the comparative graph of the answers of teachers and learners to the same questions (questions Q2, Q3 and Q4 are in different order in both questionnaires). Of course, there are some differences, but they are not so big, except maybe the answer to the question Q5 (**T:** Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training? **L:** Would you use the Dys2Go learning games at home for self-training?). Very optimistic is the fact that both teachers and learners gave very high marks answering the question if they would recommend DYS2GO learning games to their colleagues and friends/classmates respectively (Q9).

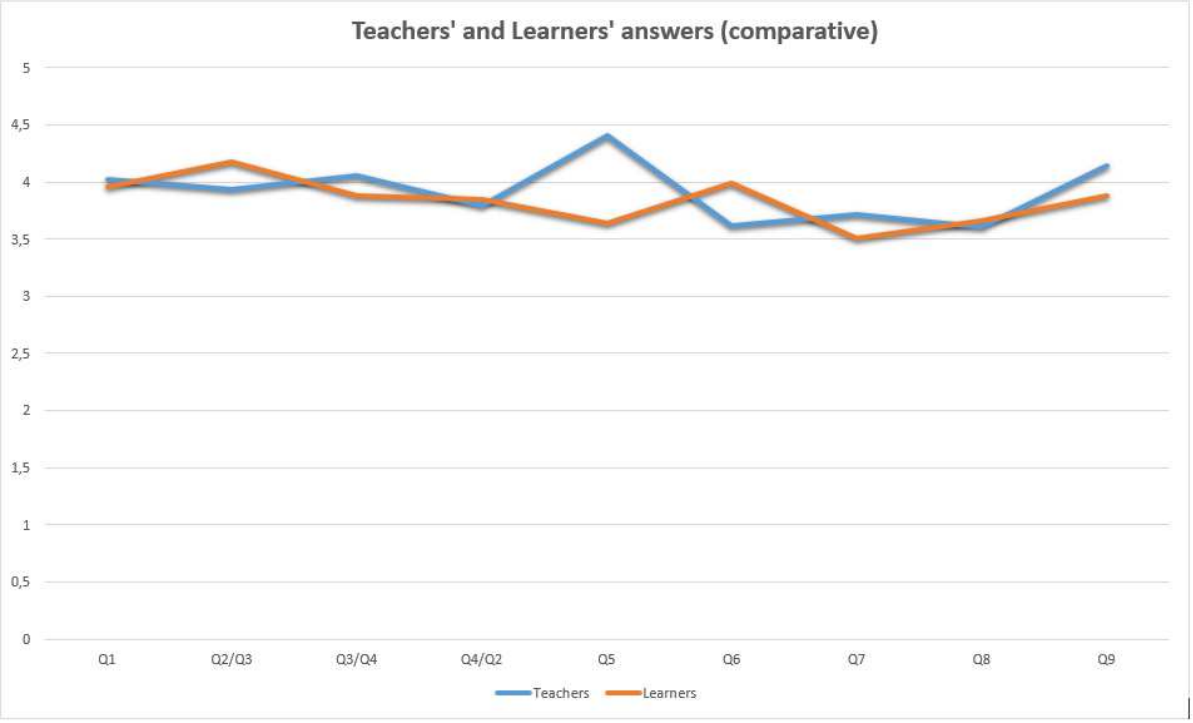


Fig.21: Comparison of the teachers' and learners' answers

8.3. Positives and Negatives

Among the main positives of the application users (teachers and learners) who participated in the testing listed:

- Most of the games are interesting and useful; animations are quite interesting and diverse; youngsters like the different and unique tasks.
- The game is compelling, the graphics look nice, the tasks are interesting and I really like the ability to choose different levels.
- Teachers think that the games easily could be used as part of the classroom work.
- Good option – to choose between storylines and index games
- A big plus are the storylines as they give opportunity not only to train skills but to get and learn some info

- Different levels of difficulty available
- Possibility to play games separately from storylines
- "Family secret" and "Lost in the pyramid" storylines were pointed out as liked the most by youngsters.
- Very well-prepared games for visual and spatial orientation.
- Real (human) voice in the Latvian version.

As main negative of the application was pointed out the long time necessary for downloading the App. Some of the others:

- Don't like Robbie and the fact that he makes repeatedly the same movements; if possible to change Robbie's voice - it is very dull and lacks emotion;
- Some technical problems, like slow turning of the cards/elements in some games, not good enough quality of the images in some games, too loud or too quite sounds in some auditory games, etc.
- The fact that the tasks can be skipped and the players are still awarded points makes the game less captivating and does not motivate to put much effort

8.4. Suggestions for improvement

- To improve the installation of DYS2GO in Android and Windows version: to speed it up;
- To remove some Robbie animations or to play them only once (not to repeat the same gesture), or to use different animations;
- To improve navigation: In the Storylines – some buttons are not very intuitive (like Home button, Sound button, etc.); inside of the Index – to

give headings to area icons (now the icons are not very understandable for students), Number the games in each area;

- In some games clearer/more detailed instructions are needed.

9. CONCLUSIONS

The overall assessment of the games is positive. Users are pleased to be able to choose between individual games and storylines, as well as the availability of different levels of difficulty.

They express a desire for more similar games to be developed (especially teachers) and, if possible, to link the topics of the games with the educational material in different school subjects (history, geography, etc.).

It is important when presenting the games to young people to emphasize on the fact that DYS2GO are learning games and their main purpose is to provide young dyslexic with an opportunity to practice their skills in carefully chosen key areas, so they don't expect DYS2GO App to be an entertainment tool.

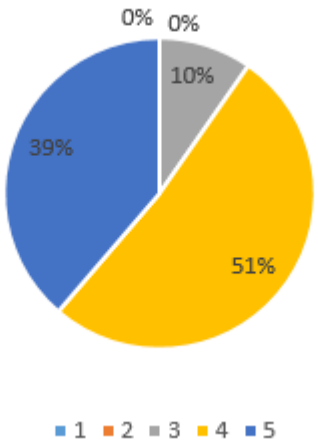
The negatives of the application that were pointed out are mostly related to the slow speed and the need for a long download time.

ANNEX 1: USERS' FEEDBACK – LATVIA /diagrams/

Questionnaire for teachers and trainers (31 responses)

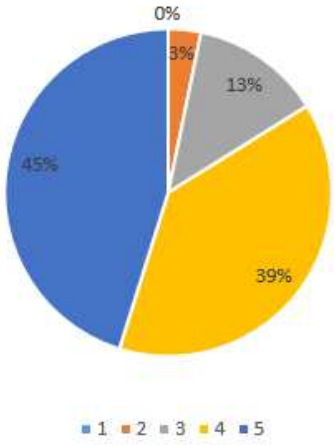
1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)



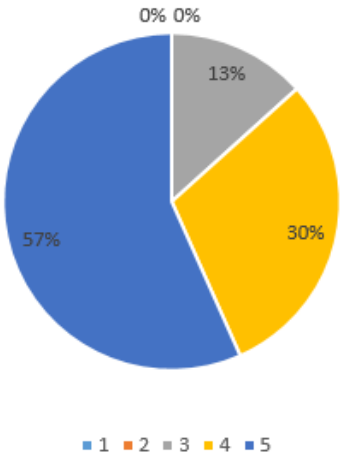
2/ Would you use the Dys2Go learning games as part of your teaching?

(1 – not at all; 5 – definitely yes)



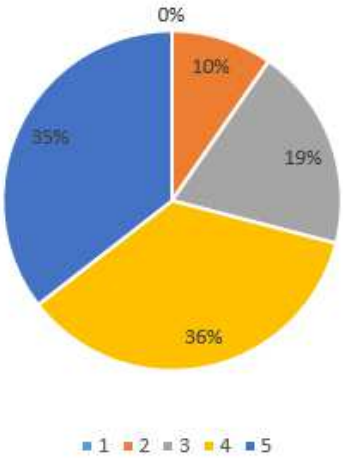
3/ Do you think the Dys2Go learning games are an effective tool for improving the young dyslexic adults' skills?

(1 - not at all; 5 – definitely yes)



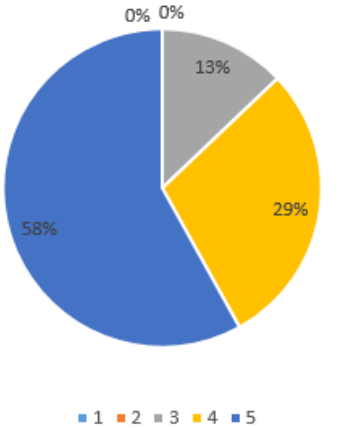
4/ Do you think that the Dys2Go learning games are interesting to young dyslexic adults?

(1 - not at all; 5 – definitely yes)



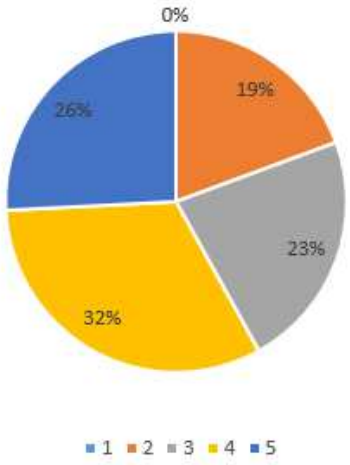
5/ Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training?

(1 - not at all; 5 – definitely yes)



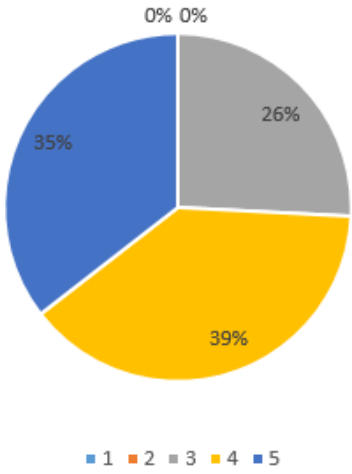
6/ Do you think the Dys2Go learning games design (images, layout, etc.) appeals to young dyslexic adults?

(1 - not at all; 5 – definitely yes)



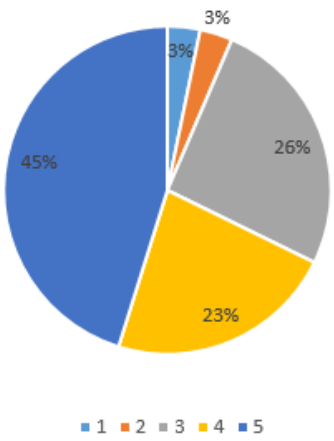
7/ Do you think the user interface of the Dys2Go learning games complies with young dyslexics' specific needs and preferences?

(1 - not at all; 5 – definitely yes)



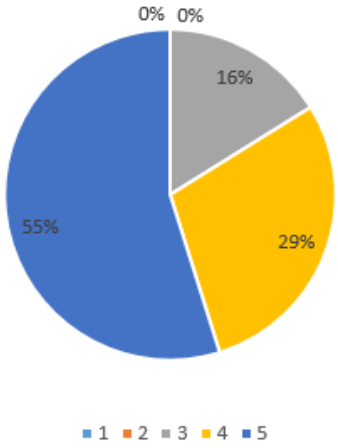
8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 - not at all; 5 – definitely yes)

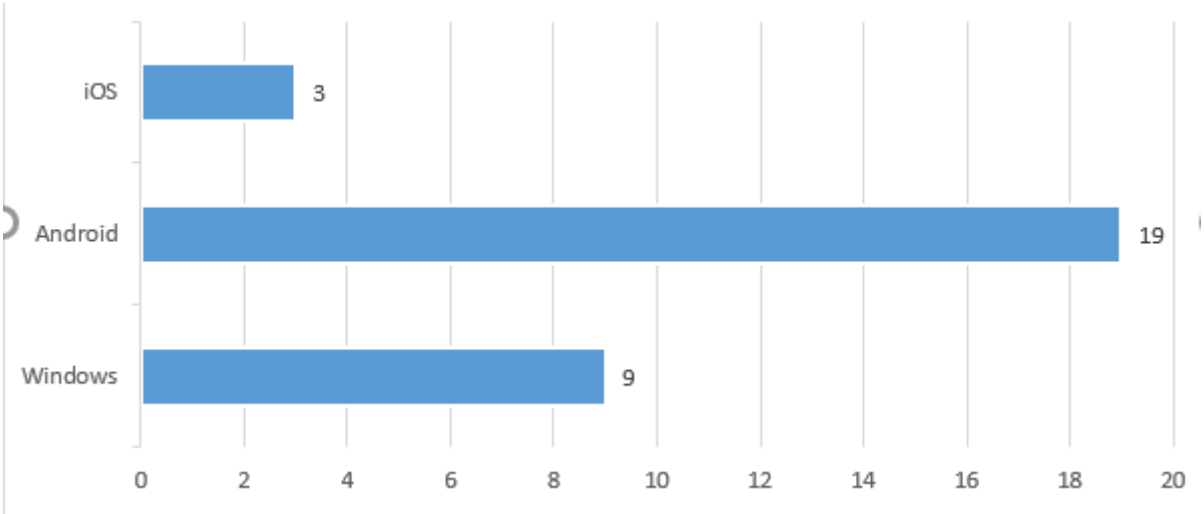


9/ Would you recommend the Dys2Go learning games to your colleagues to be used with young dyslexic adults?

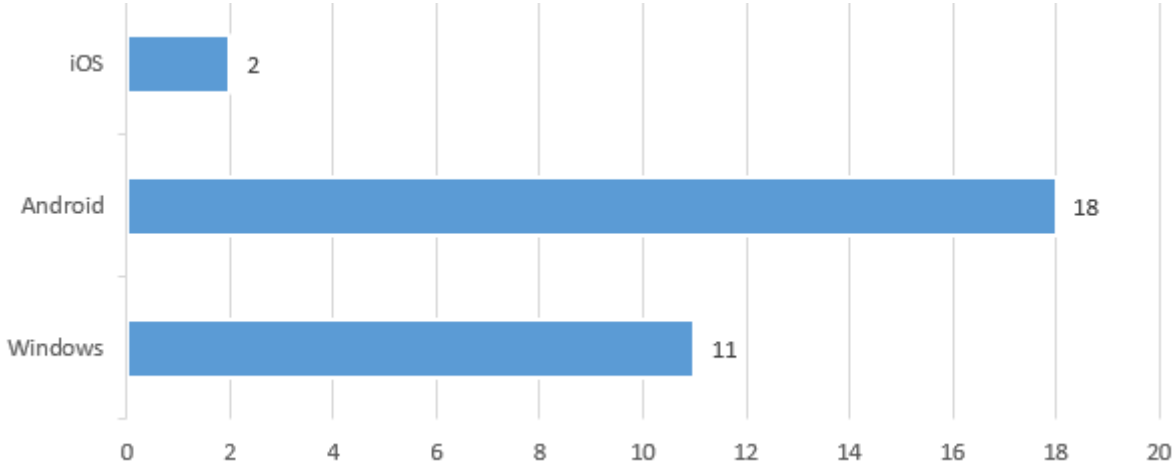
(1 - not at all; 5 – definitely yes)



10/ Which version did you use? (you may tick more than one box)



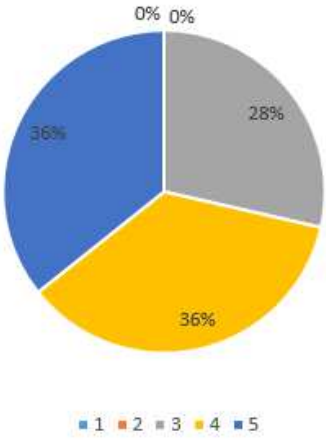
11/ Which version do you prefer?



Questionnaire for students (21 responses)

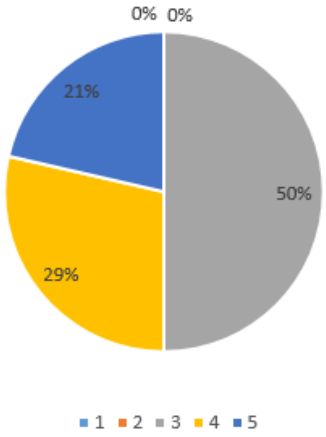
1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)



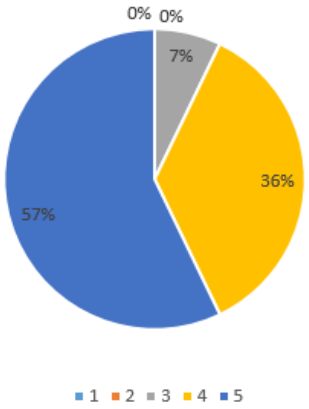
2/ How interesting do you find the topics of the Dys2Go learning games and storylines?

(1 – not at all; 5 – very interesting)



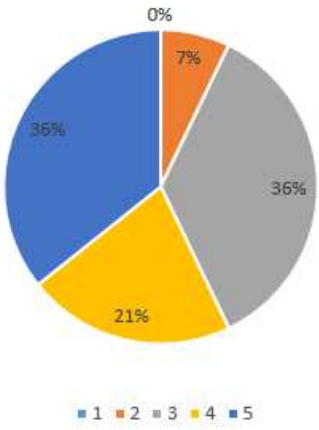
3/ Would you like the Dys2Go learning games to be included by your teachers/trainers as part of their teaching?

(1 – not at all; 5 – very interesting)



4/ Do you think that playing the Dys2Go learning games will help you to improve your skills?

(1 – not at all; 5 – very interesting)



5/ Would you use the Dys2Go learning games at home for self-training?

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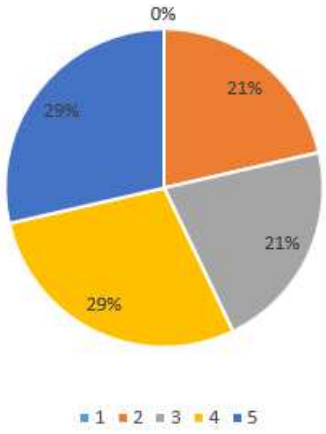
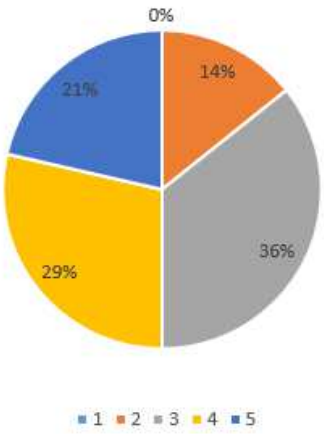


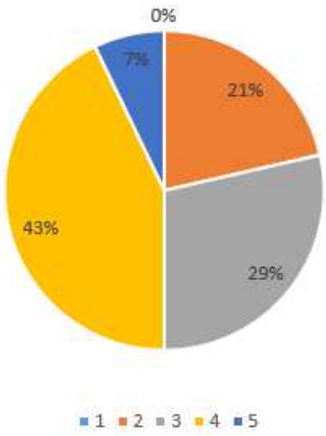
6/ Do you like the Dys2Go learning games design (images, layout, etc.)?

(1 – not at all; 5 – very interesting)



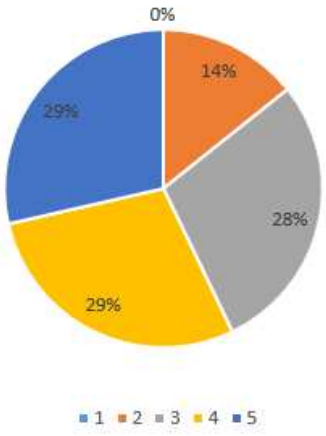
7/ Do you think the user interface of the Dys2Go learning games complies with your specific needs and preferences?

(1 – not at all; 5 – very interesting)



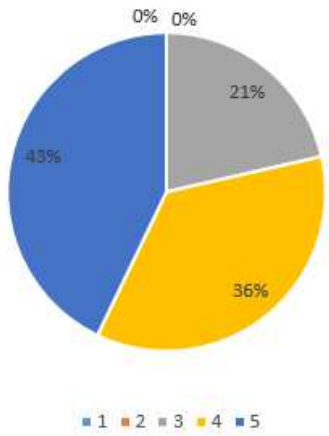
8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 – not at all; 5 – very interesting)

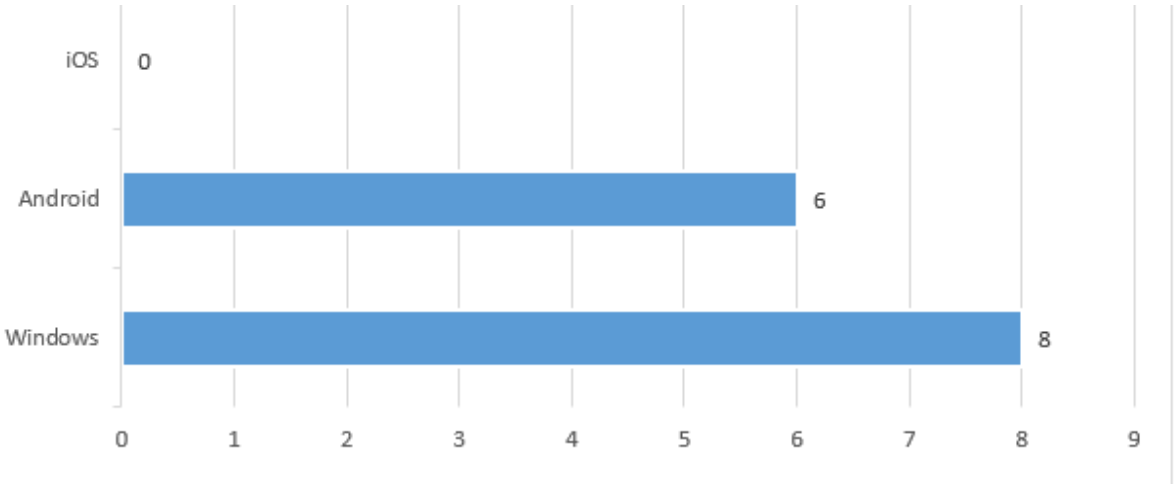


9/ Would you recommend the Dys2Go learning games to your friends and other young dyslexic adults?

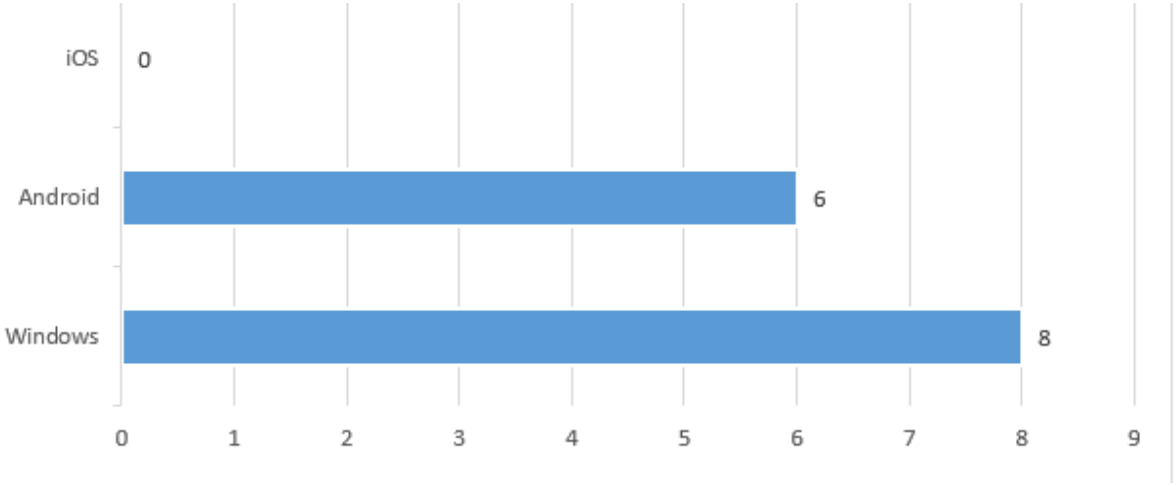
(1 – not at all; 5 – very interesting)



10/ Which version did you use? (you may tick more than one box)



11/ Which version do you prefer?

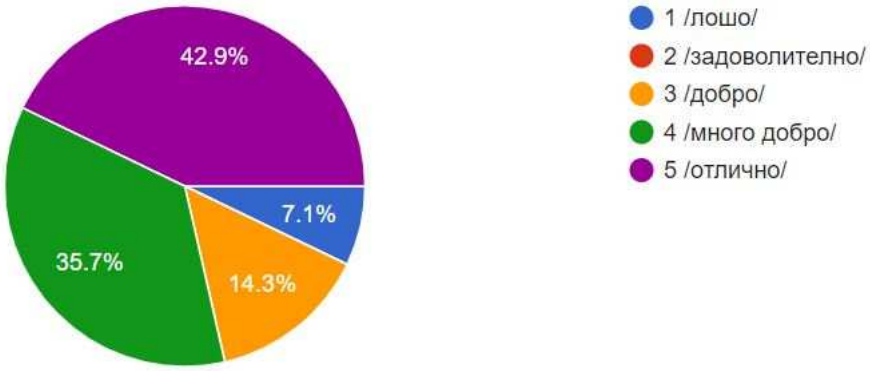


ANNEX 2: USERS' FEEDBACK – BULGARIA /diagrams/

Questionnaire for teachers and trainers (14 responses)

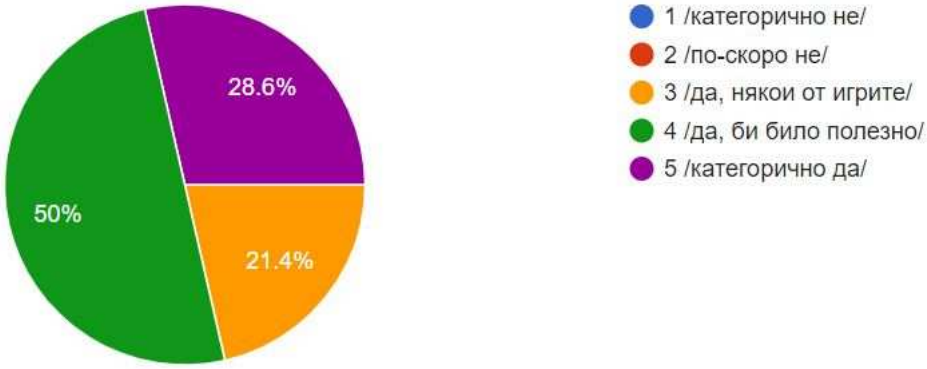
1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)



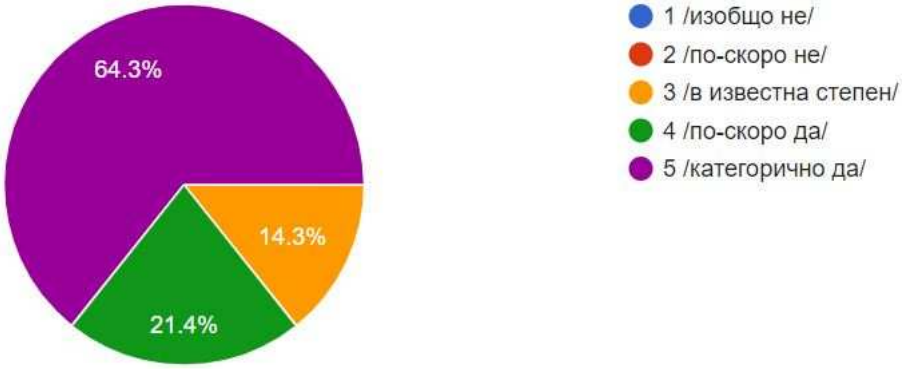
2/ Would you use the Dys2Go learning games as part of your teaching?

(1 – not at all; 5 – definitely yes)



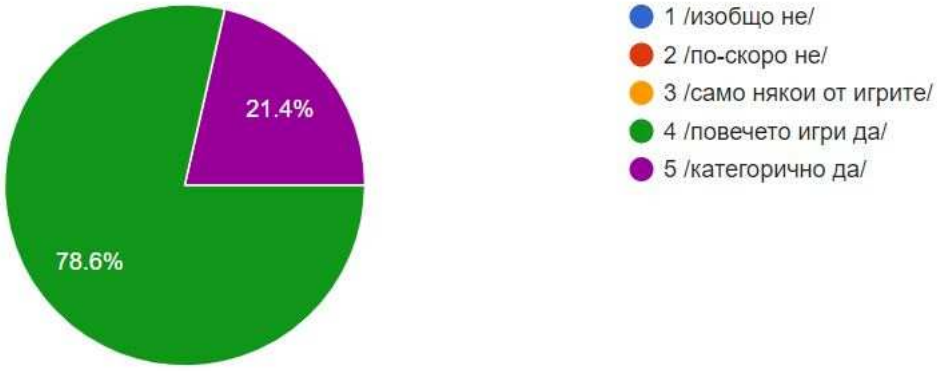
3/ Do you think the Dys2Go learning games are an effective tool for improving the young dyslexic adults' skills?

(1 - not at all; 5 – definitely yes)



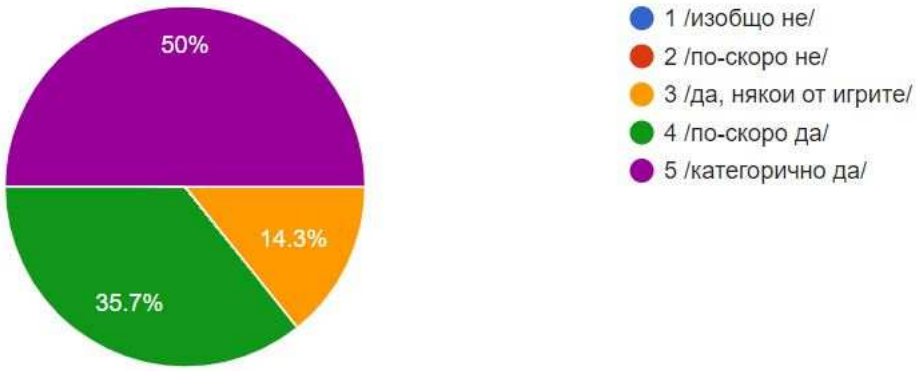
4/ Do you think that the Dys2Go learning games are interesting to young dyslexic adults?

(1 - not at all; 5 – definitely yes)



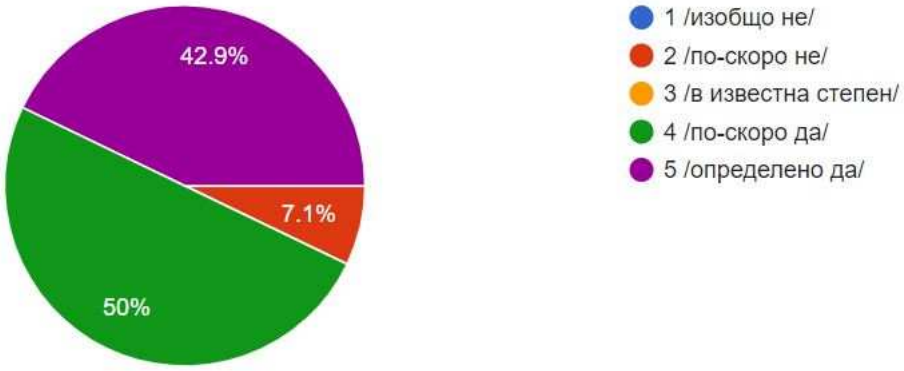
5/ Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training?

(1 - not at all; 5 – definitely yes)



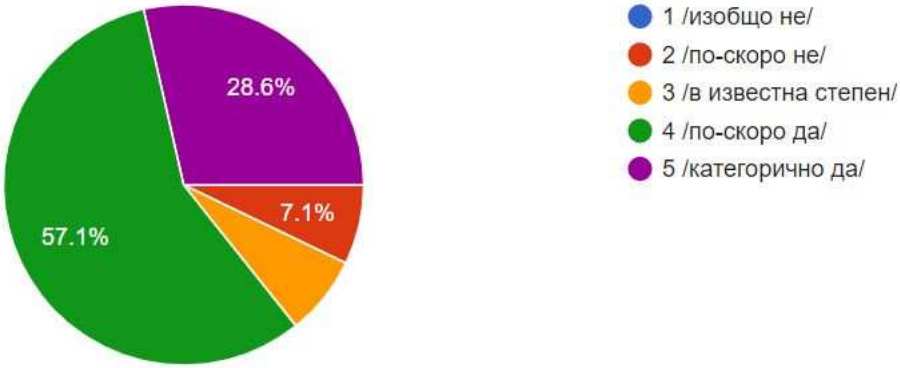
6/ Do you think the Dys2Go learning games design (images, layout, etc.) appeals to young dyslexic adults?

(1 - not at all; 5 – definitely yes)



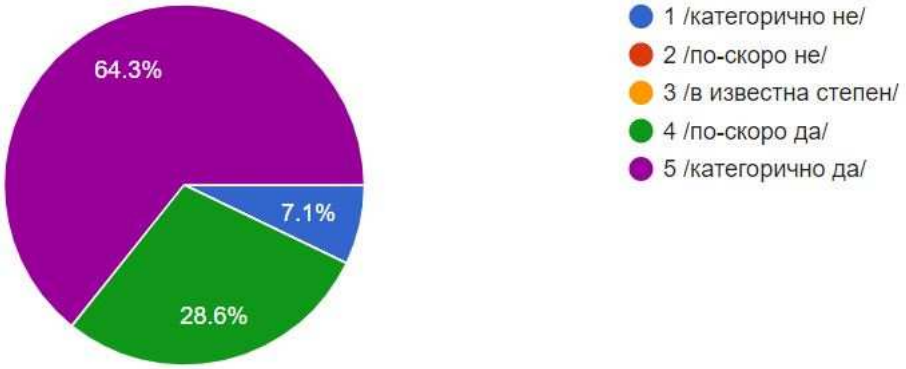
7/ Do you think the user interface of the Dys2Go learning games complies with young dyslexics' specific needs and preferences?

(1 - not at all; 5 – definitely yes)



8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 - not at all; 5 – definitely yes)



9/ Would you recommend the Dys2Go learning games to your colleagues to be used with young dyslexic adults?

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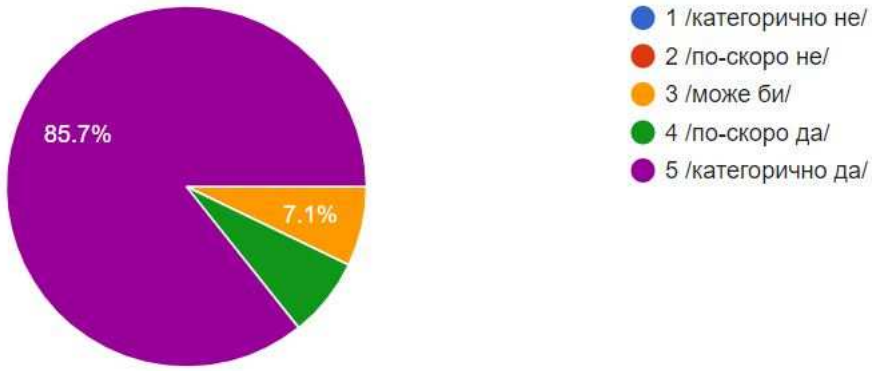
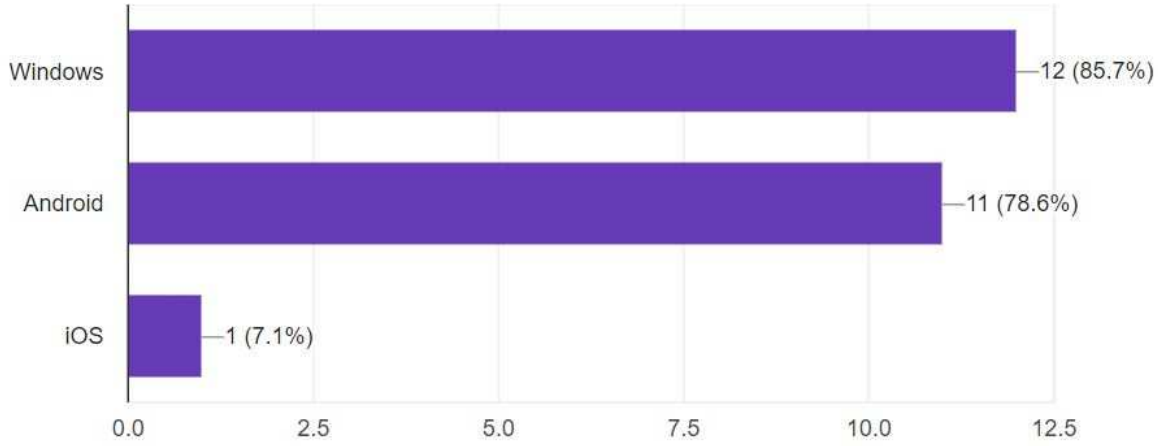


10/ Which version did you use? (you may tick more than one box)



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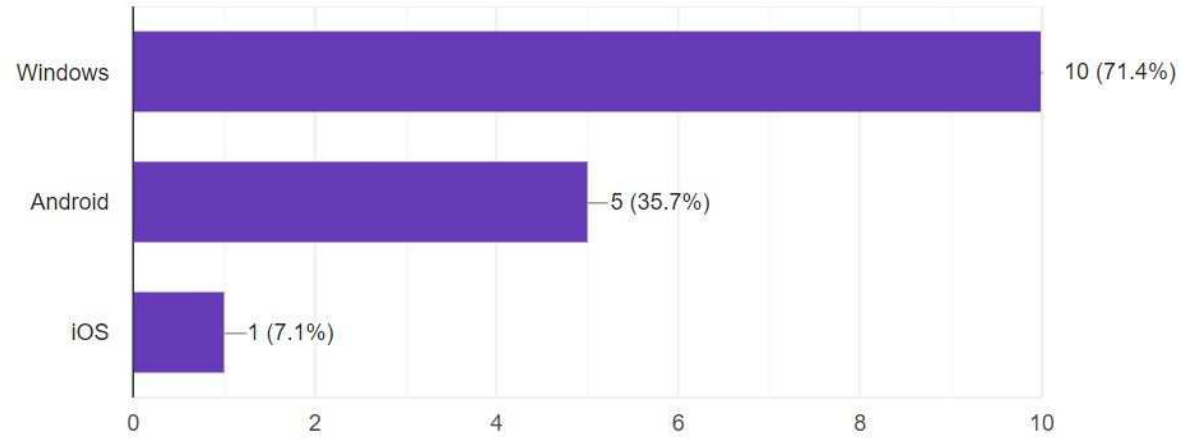
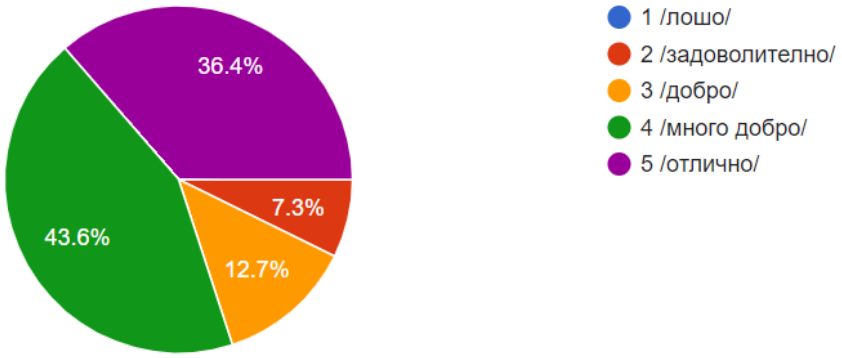


Questionnaire for students (55 responses)

1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)

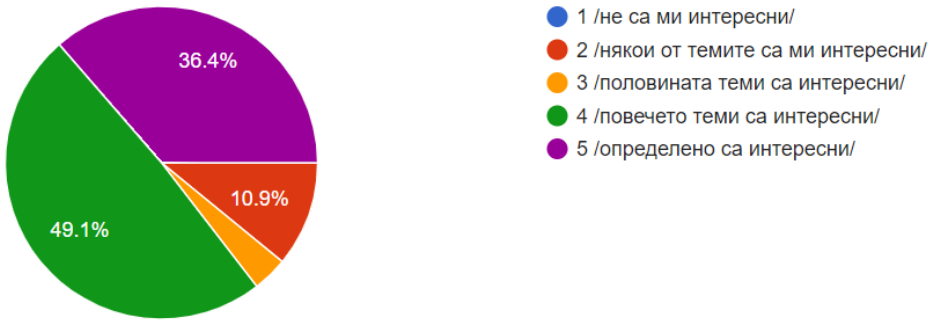
55 responses



2/ How interesting do you find the topics of the Dys2Go learning games and storylines?

(1 – not at all; 5 – very interesting)

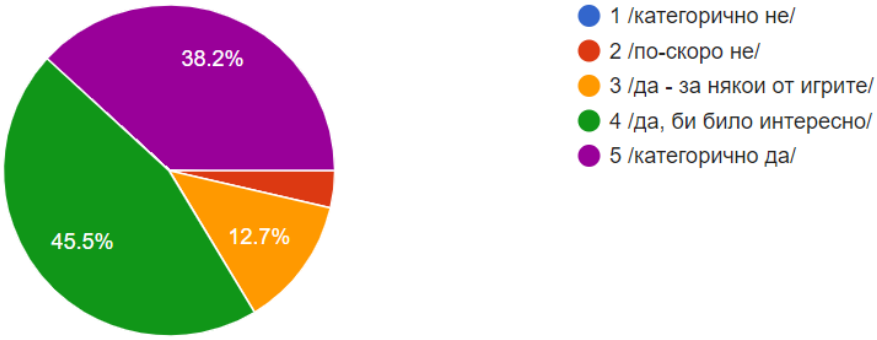
55 responses



3/ Would you like the Dys2Go learning games to be included by your teachers/trainers as part of their teaching?

(1 – not at all; 5 – very interesting)

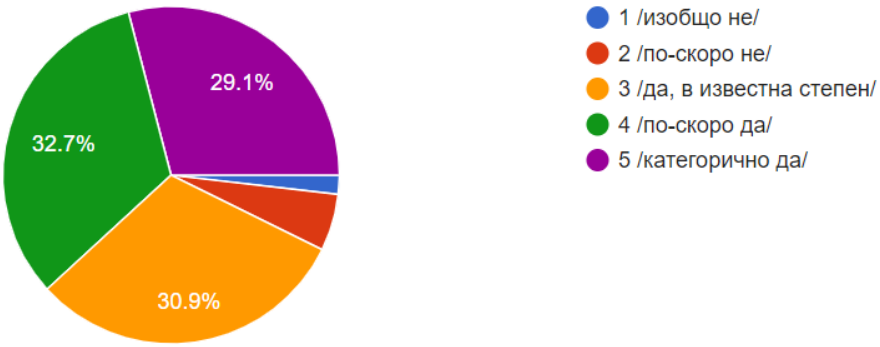
55 responses



4/ Do you think that playing the Dys2Go learning games will help you to improve your skills?

(1 – not at all; 5 – very interesting)

55 responses



5/ Would you use the Dys2Go learning games at home for self-training?

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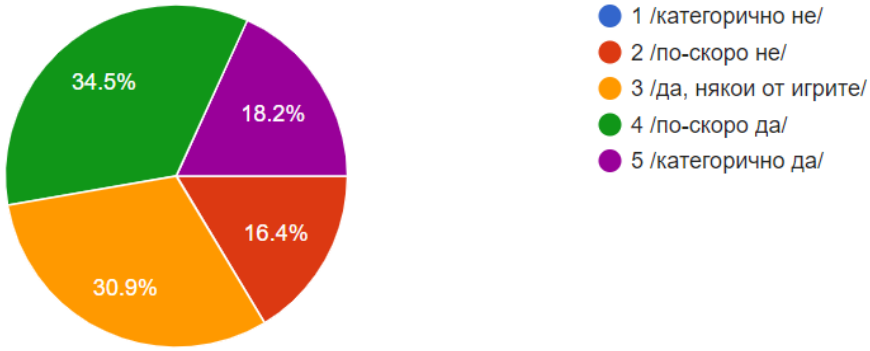
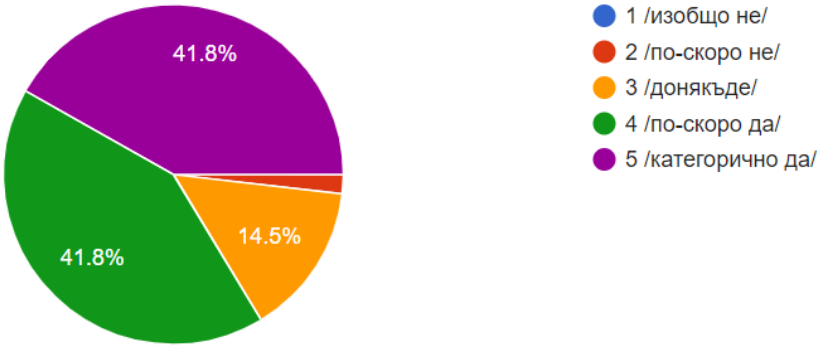
55 responses



6/ Do you like the Dys2Go learning games design (images, layout, etc.)?

(1 – not at all; 5 – very interesting)

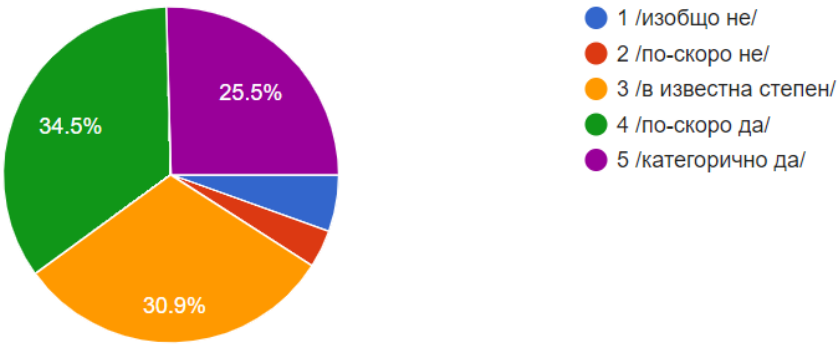
55 responses



7/ Do you think the user interface of the Dys2Go learning games complies with your specific needs and preferences?

(1 – not at all; 5 – very interesting)

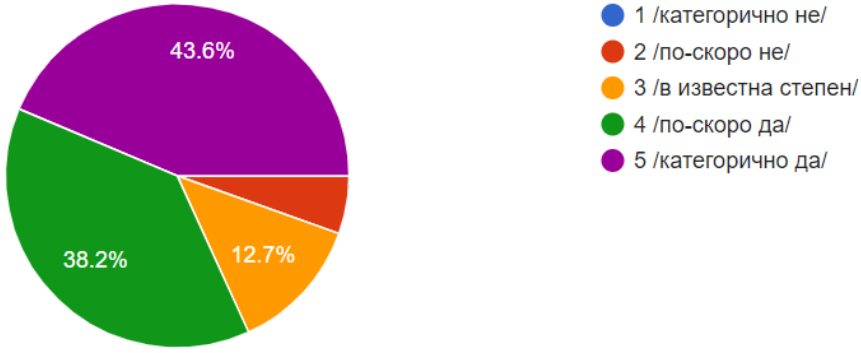
55 responses



8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 – not at all; 5 – very interesting)

55 responses



9/ Would you recommend the Dys2Go learning games to your friends and other young dyslexic adults?

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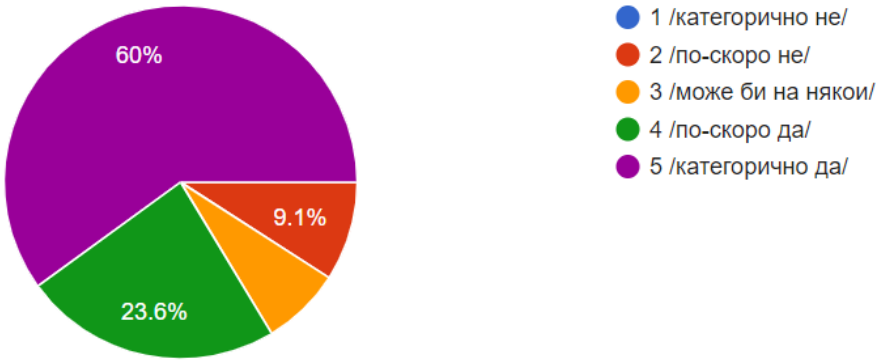
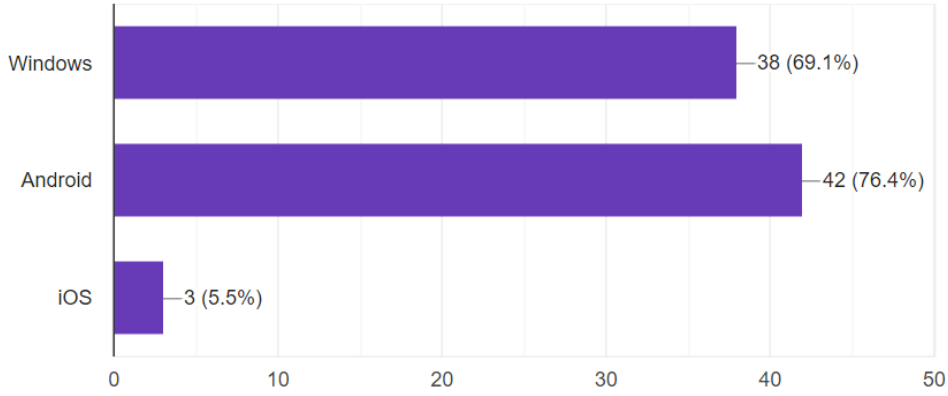


10/ Which version did you use? (you may tick more than one box)

55 responses



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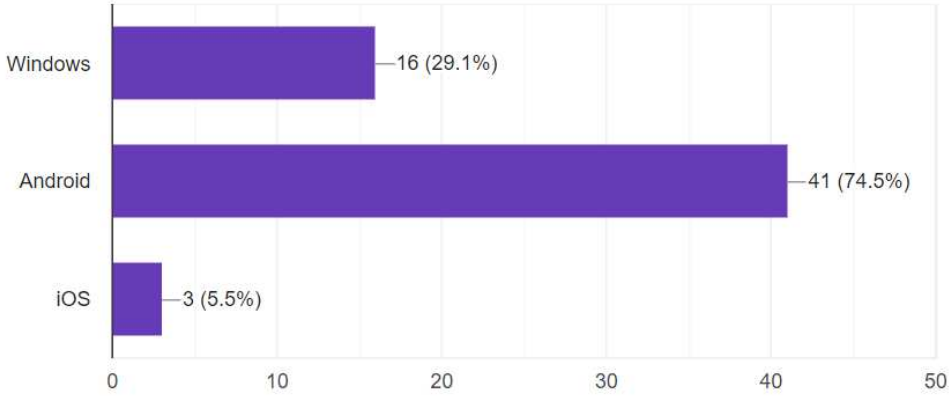
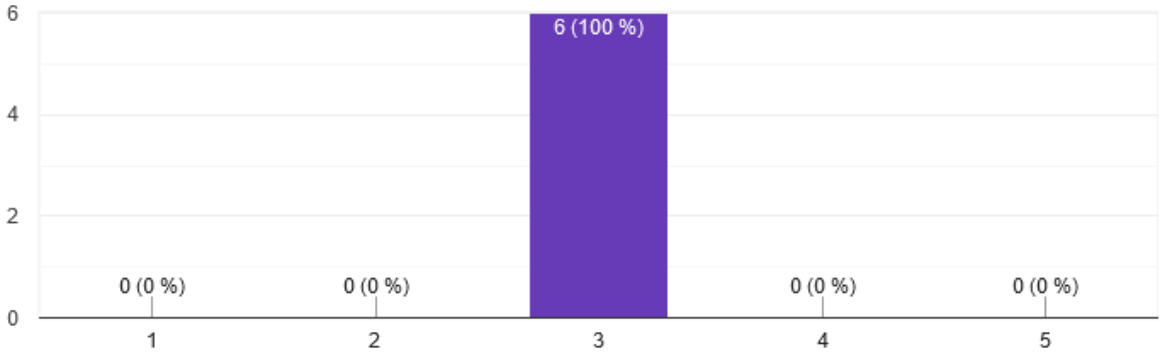


ANNEX 3: USERS' FEEDBACK – CZECH REPUBLIC /diagrams/

Questionnaire for teachers and trainers (6 responses)

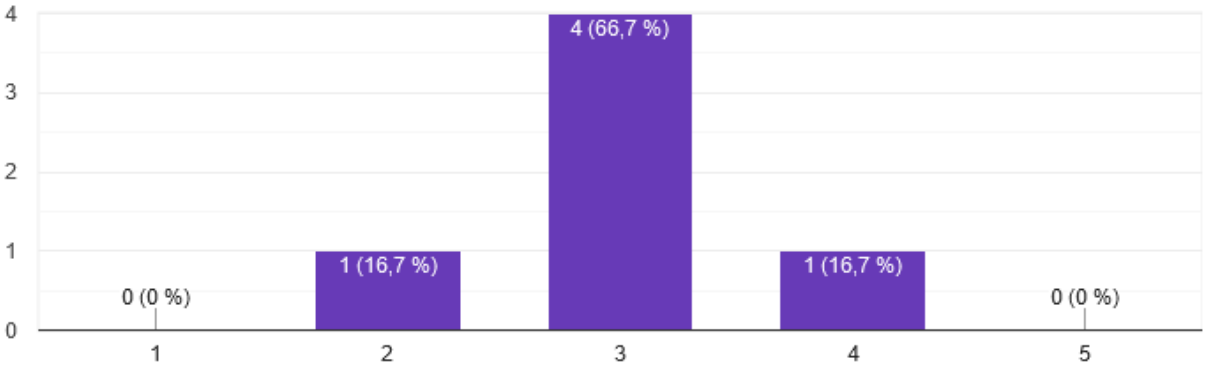
1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)



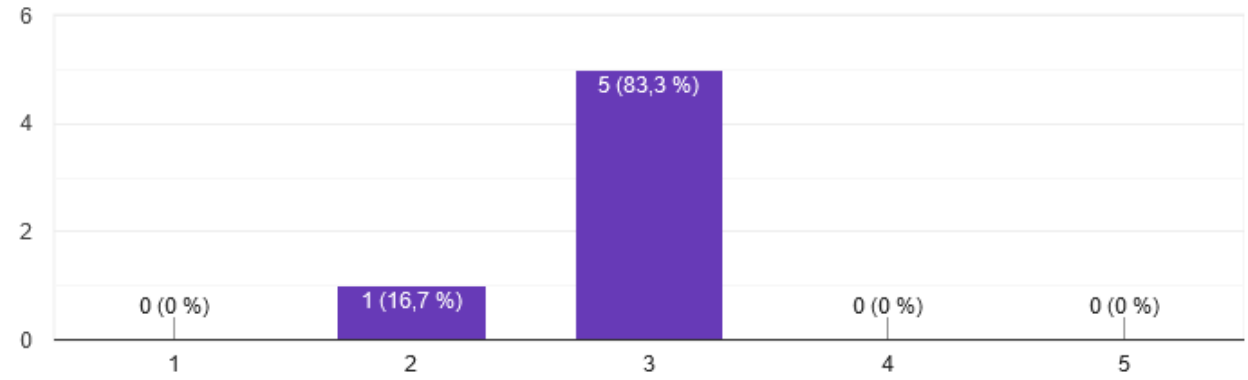
2/ Would you use the Dys2Go learning games as part of your teaching?

(1 – not at all; 5 – definitely yes)



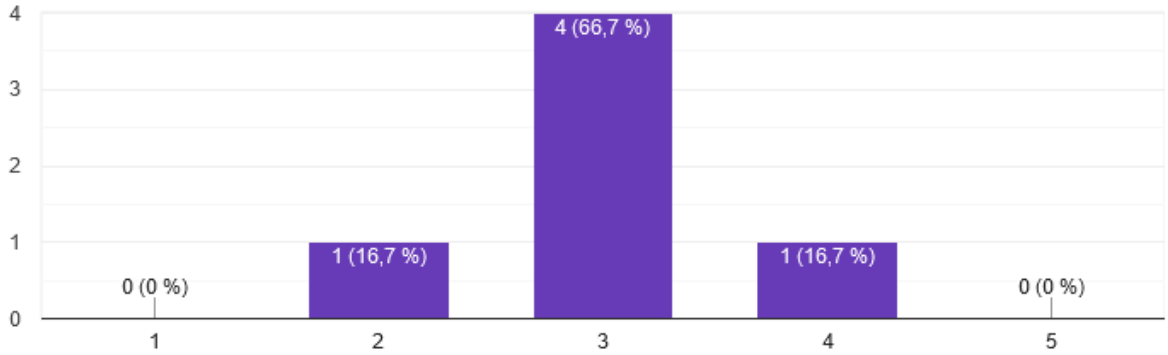
3/ Do you think the Dys2Go learning games are an effective tool for improving the young dyslexic adults' skills?

(1 - not at all; 5 – definitely yes)



4/ Do you think that the Dys2Go learning games are interesting to young dyslexic adults?

(1 - not at all; 5 – definitely yes)



5/ Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training?

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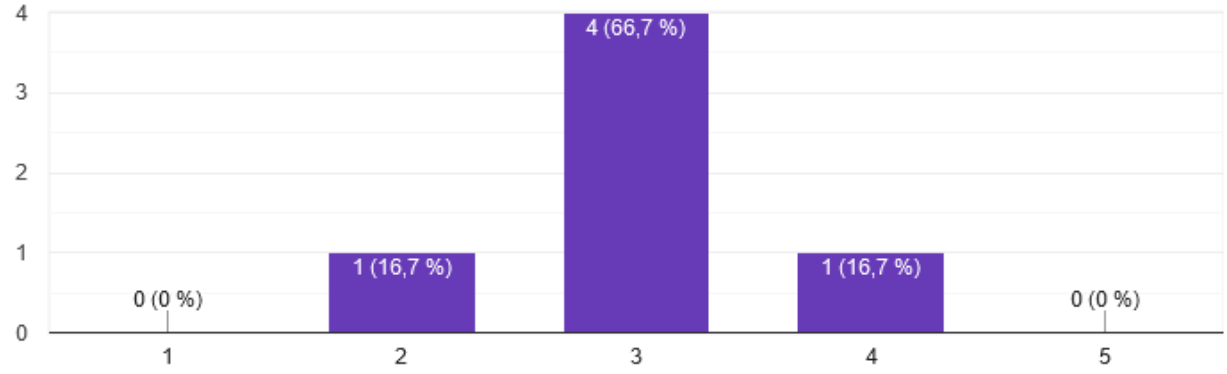
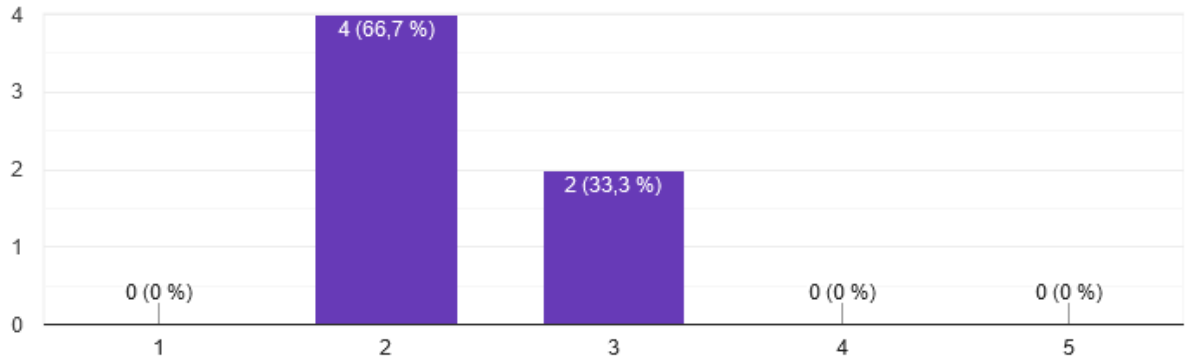


6/ Do you think the Dys2Go learning games design (images, layout, etc.) appeals to young dyslexic adults?

(1 - not at all; 5 – definitely yes)



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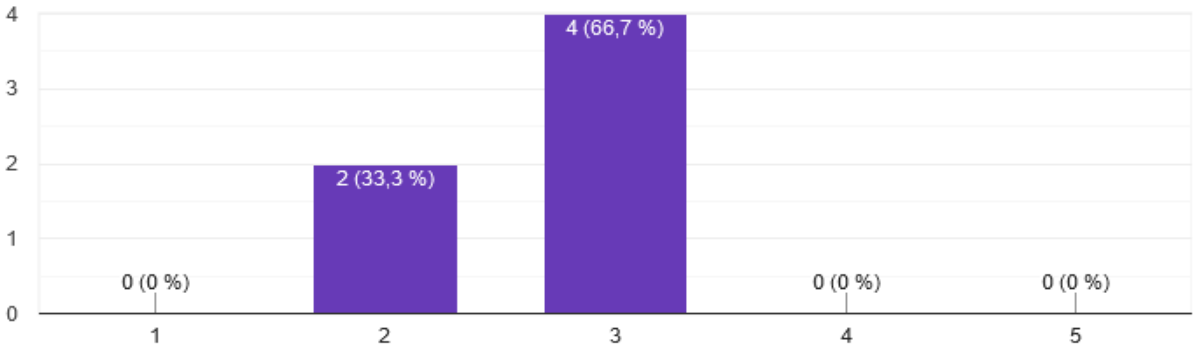

8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

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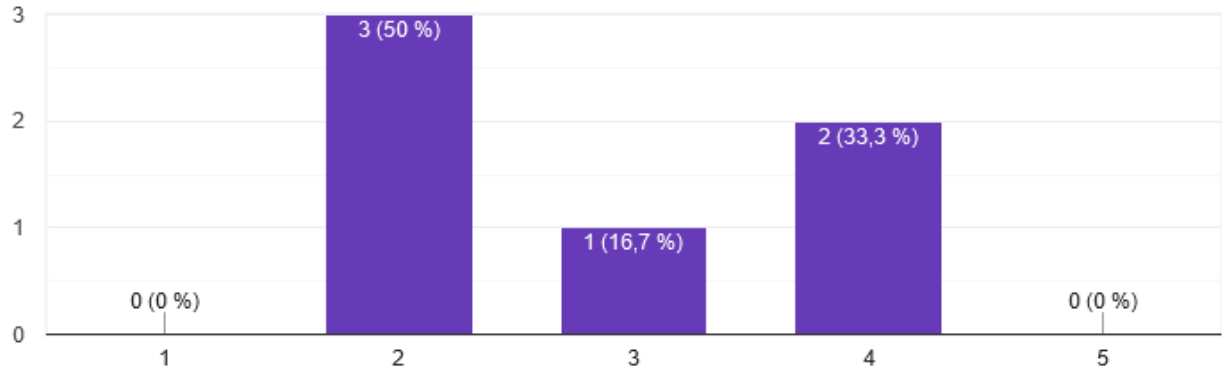

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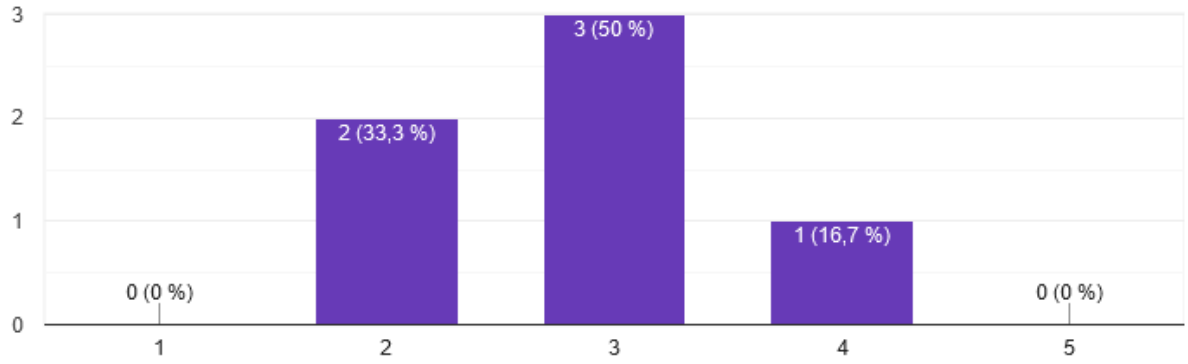

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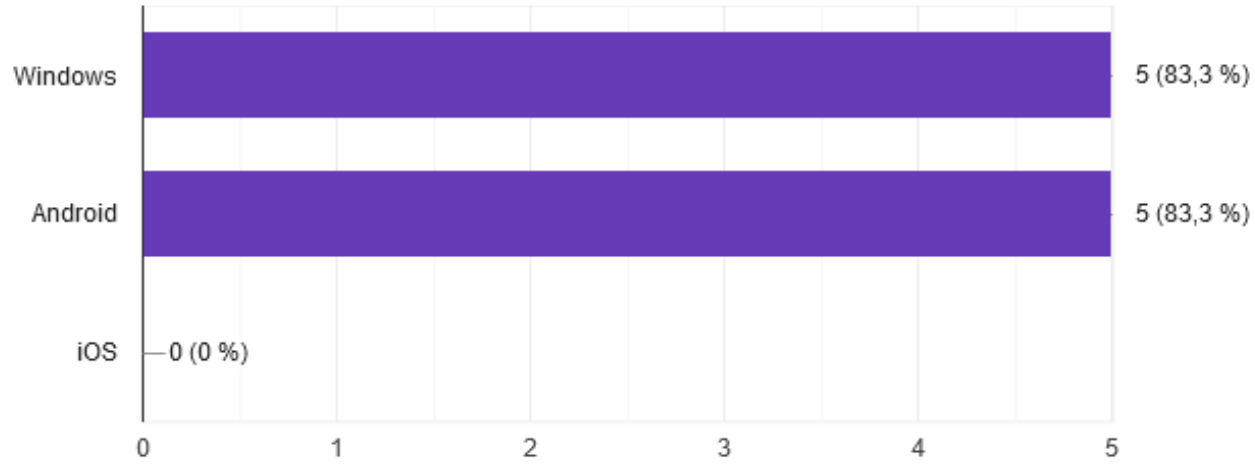

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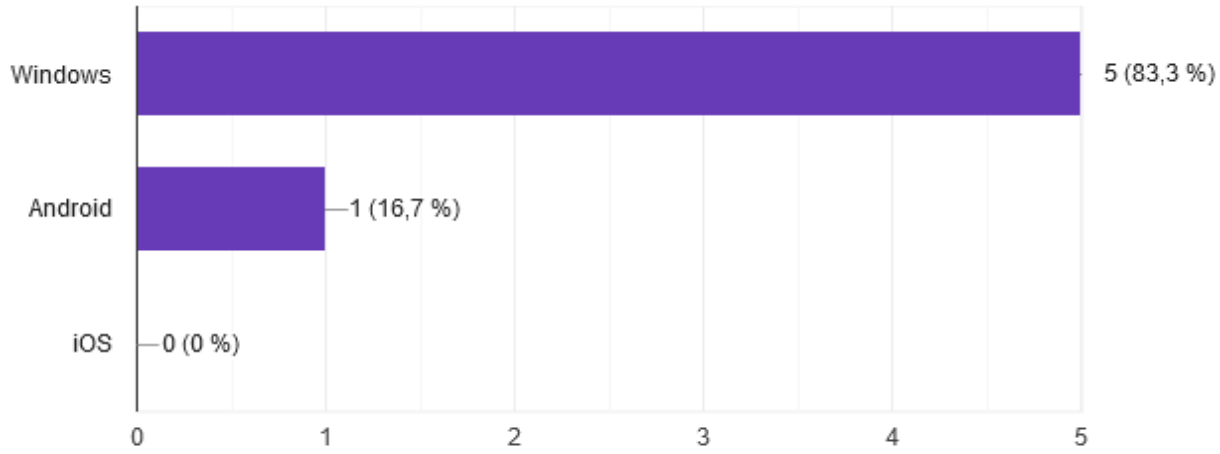
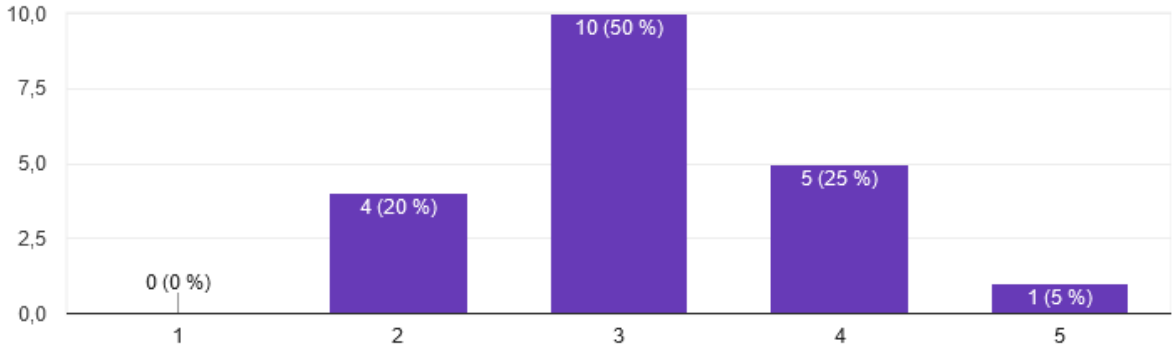


Questionnaire for students (20 responses)

1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)



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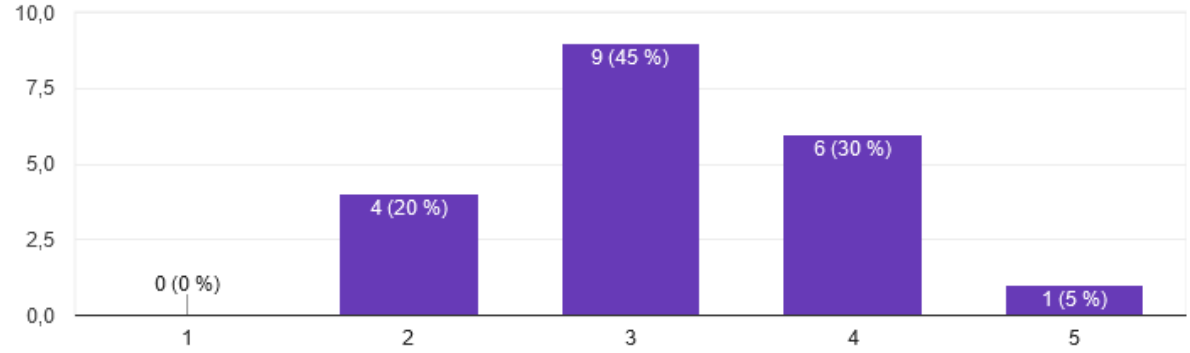

3/ Would you like the Dys2Go learning games to be included by your teachers/trainers as part of their teaching?

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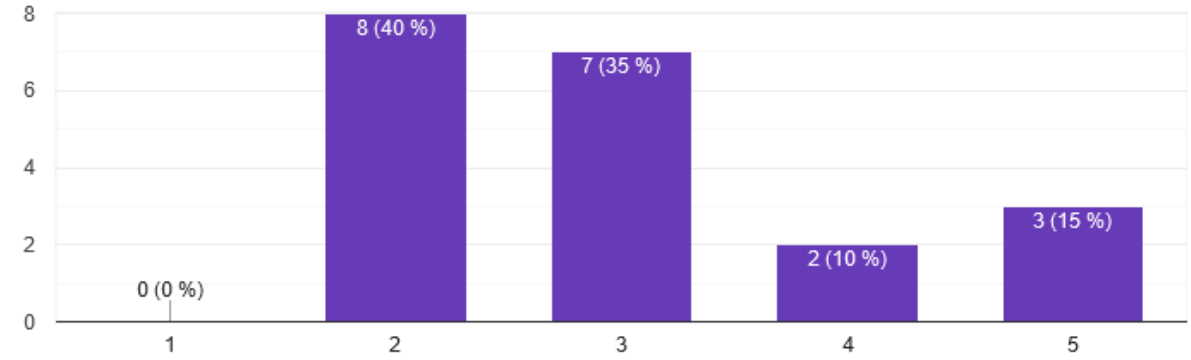

4/ Do you think that playing the Dys2Go learning games will help you to improve your skills?

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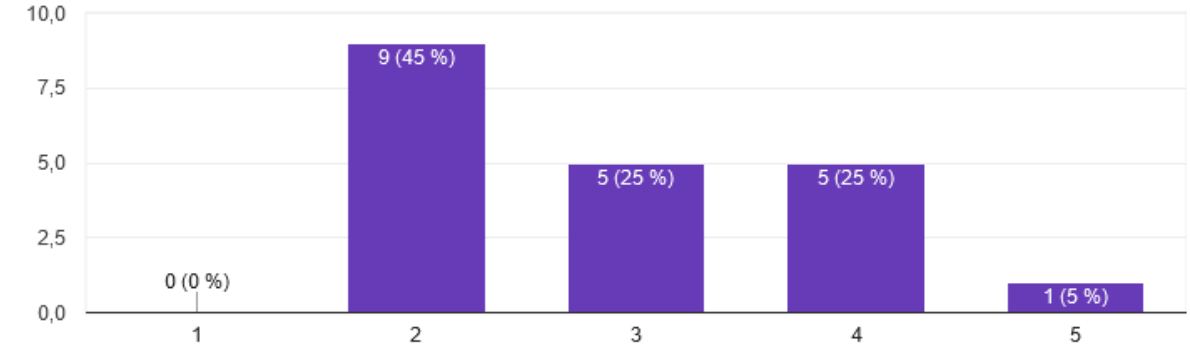

5/ Would you use the Dys2Go learning games at home for self-training?

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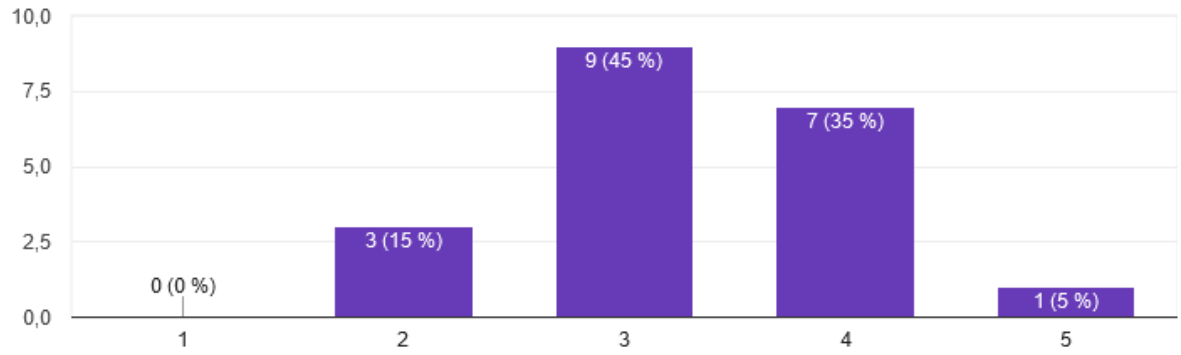

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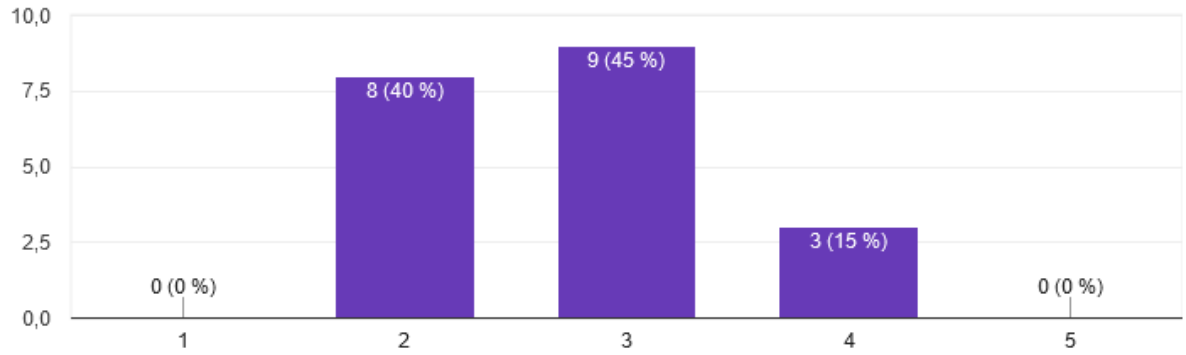

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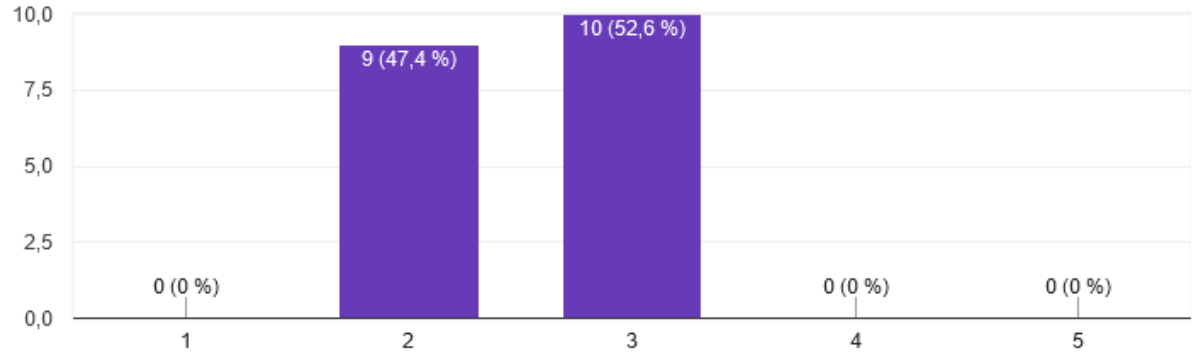
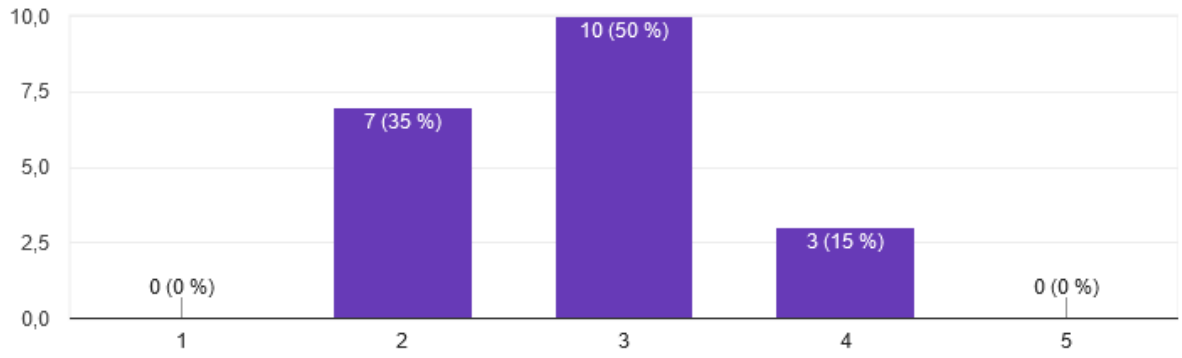


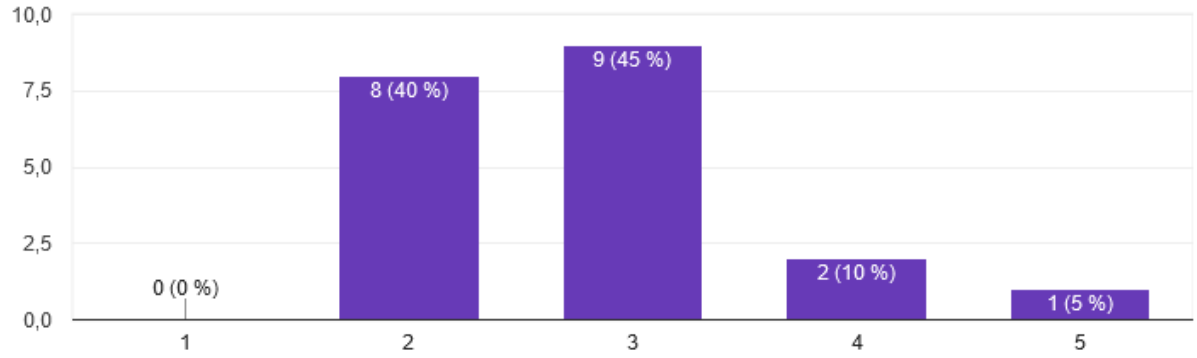
8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 – not at all; 5 – very interesting)

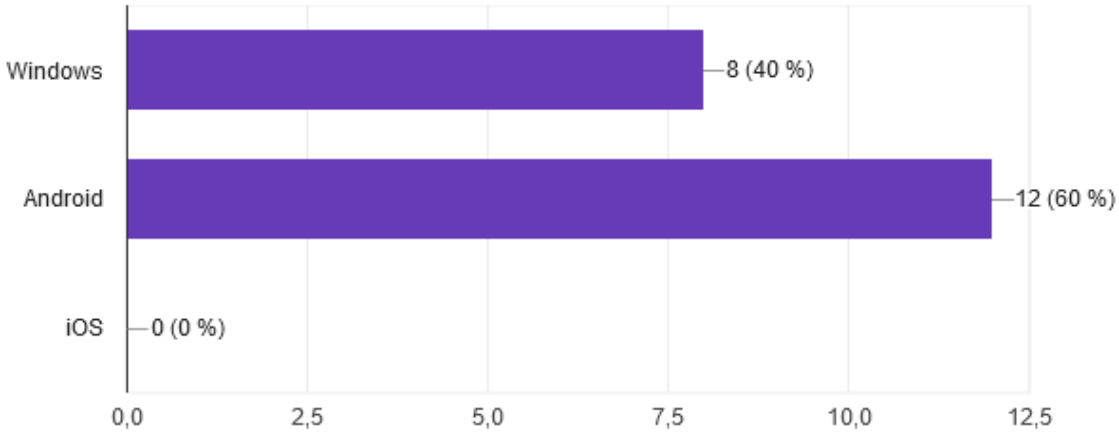


9/ Would you recommend the Dys2Go learning games to your friends and other young dyslexic adults?

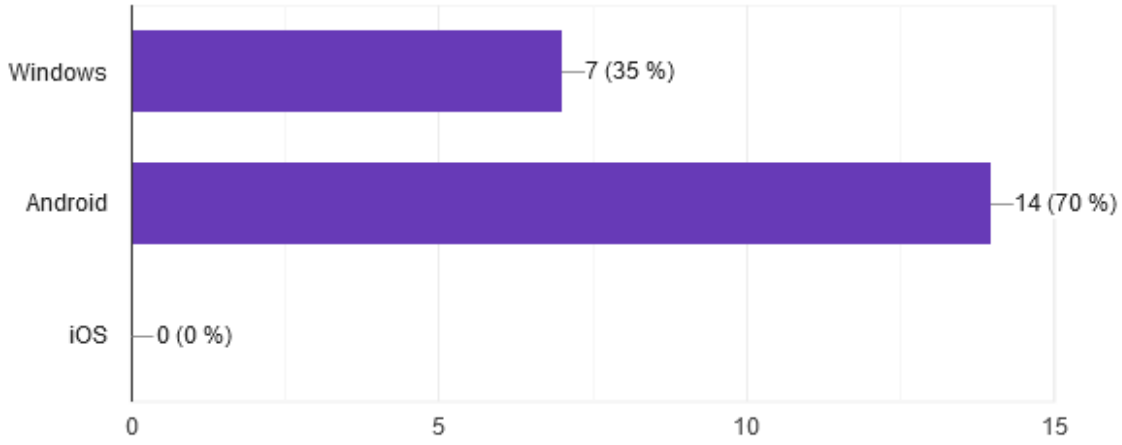
(1 – not at all; 5 – very interesting)



10/ Which version did you use? (you may tick more than one box)



11/ Which version do you prefer?

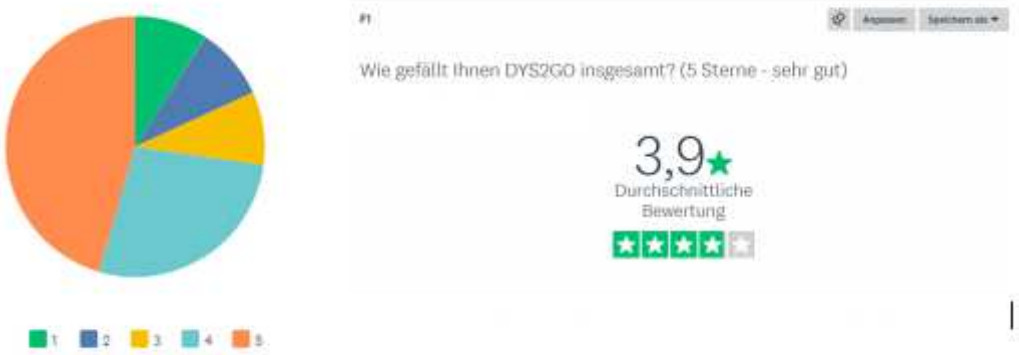

Windows
7 (35 %)
Android
14 (70 %)
iOS
0 (0 %)
0
5
10
15

ANNEX 4: USERS' FEEDBACK – AUSTRIA and GERMANY /diagrams/

Questionnaire for teachers and trainers (21 responses)

1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)



2/ Would you use the Dys2Go learning games as part of your teaching?

(1 – not at all; 5 – definitely yes)

3/ Do you think the Dys2Go learning games are an effective tool for improving the young dyslexic adults' skills?

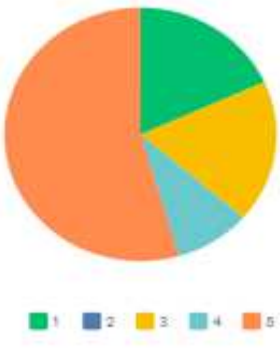
(1 - not at all; 5 – definitely yes)

4/ Do you think that the Dys2Go learning games are interesting to young dyslexic adults?

(1 - not at all; 5 – definitely yes)

5/ Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training?

(1 - not at all; 5 – definitely



yes)

6/ Do you think the Dys2Go learning games design (images, layout, etc.) appeals to young dyslexic adults?

7/ Do you think the user interface of the Dys2Go learning games complies with young dyslexics' specific needs and preferences?

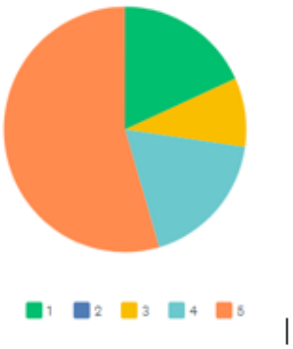
(1 - not at all; 5 – definitely yes)

8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 - not at all; 5 – definitely yes)

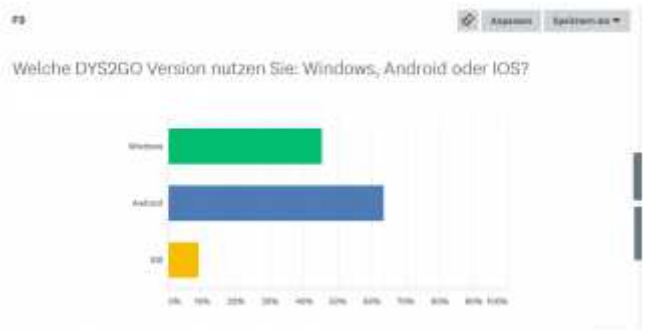
9/ Would you recommend the Dys2Go learning games to your colleagues to be used with young dyslexic adults?

(1 - not at all; 5 – definitely yes)



10/ Which version did you use? (you may tick more than one box)

11/ Which version do you prefer? Only one person used all three versions.



Questionnaire for students (25 responses)

1/ What is your overall impression of the Dys2Go learning games?

(1 – very bad; 5 – excellent)

2/ How interesting do you find the topics of the Dys2Go learning games and storylines?

(1 – not at all; 5 – very interesting)

3/ Would you like the Dys2Go learning games to be included by your teachers/trainers as part of their teaching?

(1 – not at all; 5 – very interesting)

4/ Do you think that playing the Dys2Go learning games will help you to improve your skills?

(1 – not at all; 5 – very interesting)

5/ Would you use the Dys2Go learning games at home for self-training?

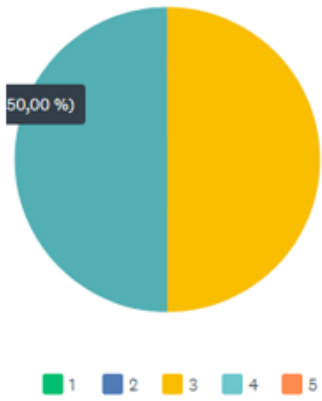
(1 – not at all; 5 – very interesting)

6/ Do you like the Dys2Go learning games design (images, layout, etc.)?

(1 – not at all; 5 – very interesting)

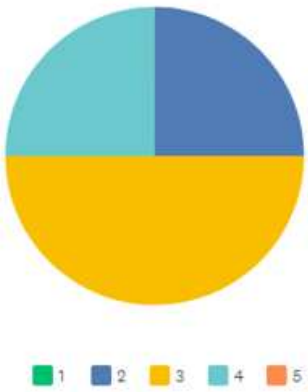
7/ Do you think the user interface of the Dys2Go learning games complies with your specific needs and preferences?

(1 – not at all; 5 – very interesting)



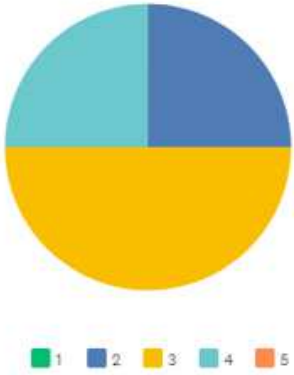
8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)?

(1 – not at all; 5 – very interesting)



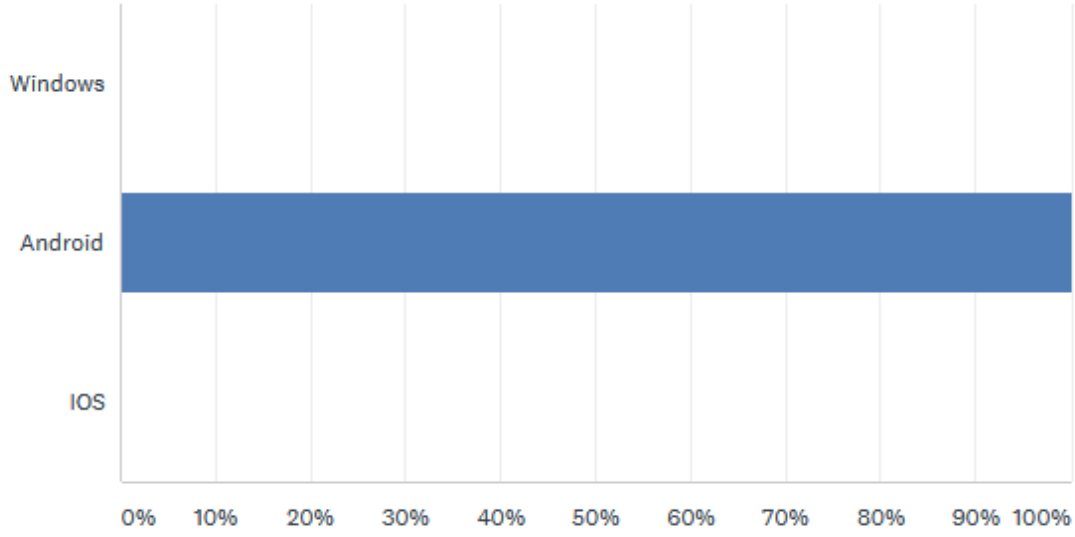
9/ Would you recommend the Dys2Go learning games to your friends and other young dyslexic adults?

(1 – not at all; 5 – very interesting)



10/ Which version did you use? (you may tick more than one box)

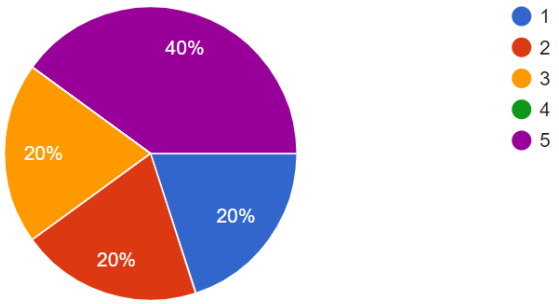
11/ Which version do you prefer? All youngsters used Android.



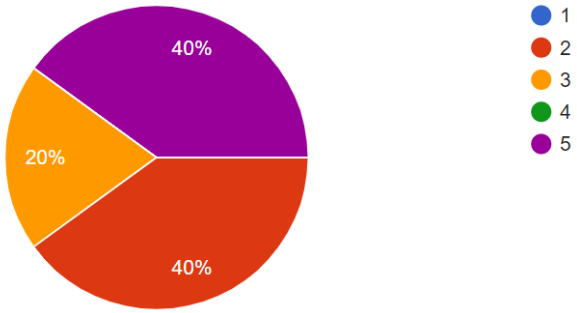
ANNEX 5: USERS' FEEDBACK – LITHUANIA /diagrams/

Questionnaire for teachers and specialists (5 responses)

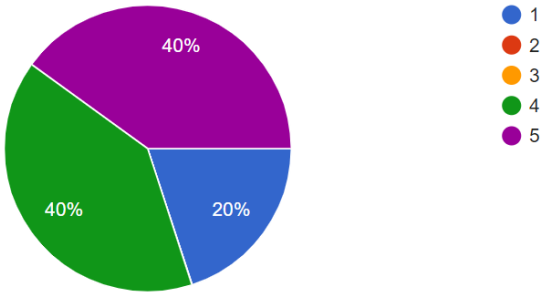
1/ What is your overall impression of the Dys2Go learning games? *(1 – very bad; 5 – excellent)*



2/ Would you use the Dys2Go learning games as part of your teaching? *(1 – not at all; 5 – definitely yes)*

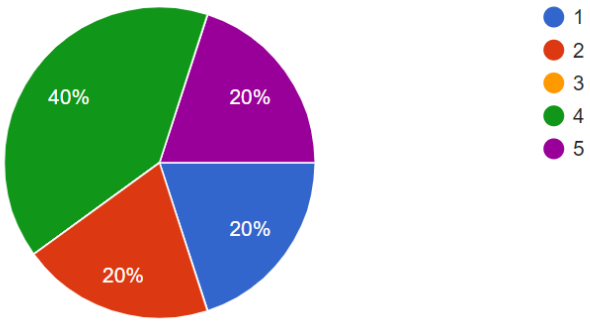


3/ Do you think the Dys2Go learning games are an effective tool for improving the young dyslexic adults' skills? *(1 - not at all; 5 – definitely yes)*

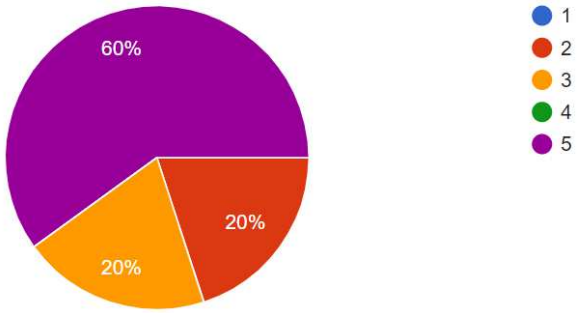


4/ Do you think that the Dys2Go learning games are interesting to young dyslexic adults?

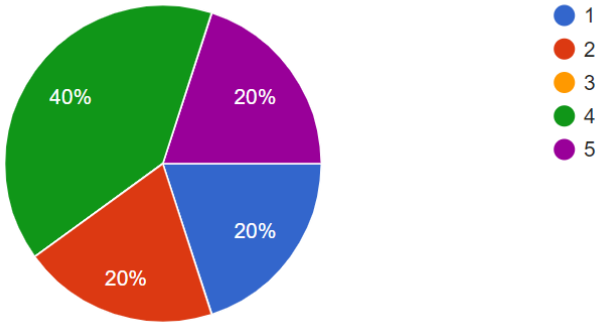
(1 - not at all; 5 – definitely yes)



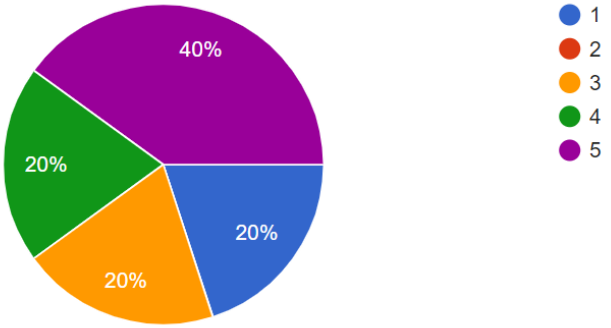
5/ Would you encourage your dyslexic students to play the Dys2Go learning games at home for self-training? *(1 - not at all; 5 – definitely yes)*



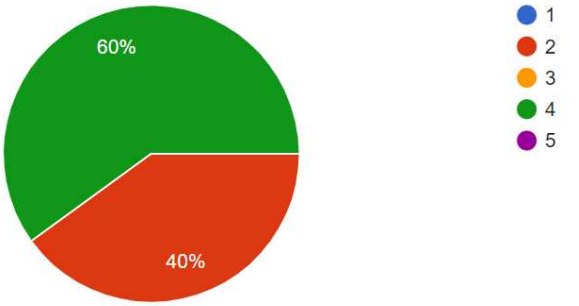
6/ Do you think the Dys2Go learning games design (images, layout, etc.) appeals to young dyslexic adults? *(1 - not at all; 5 – definitely yes)*



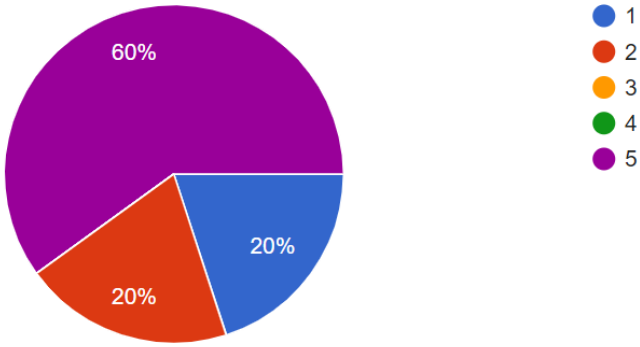
7/ Do you think the user interface of the Dys2Go learning games complies with young dyslexics' specific needs and preferences? *(1 - not at all; 5 – definitely yes)*



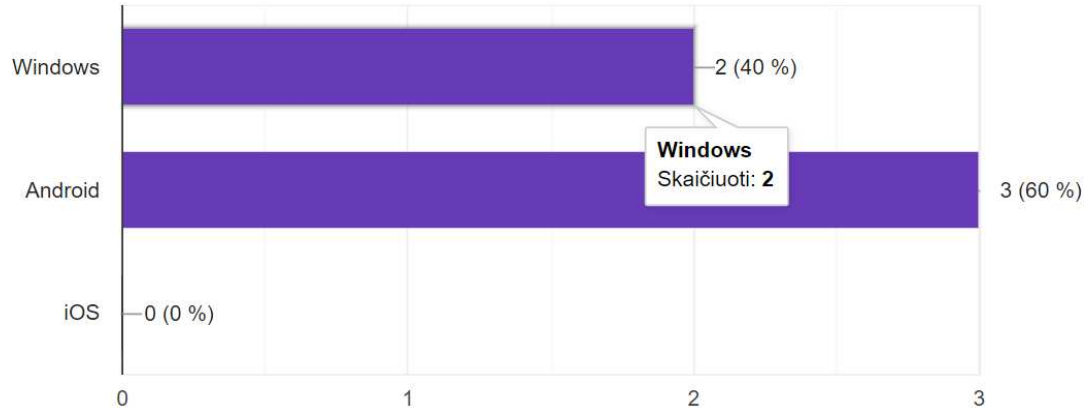
8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)? *(1 - not at all; 5 – definitely yes)*



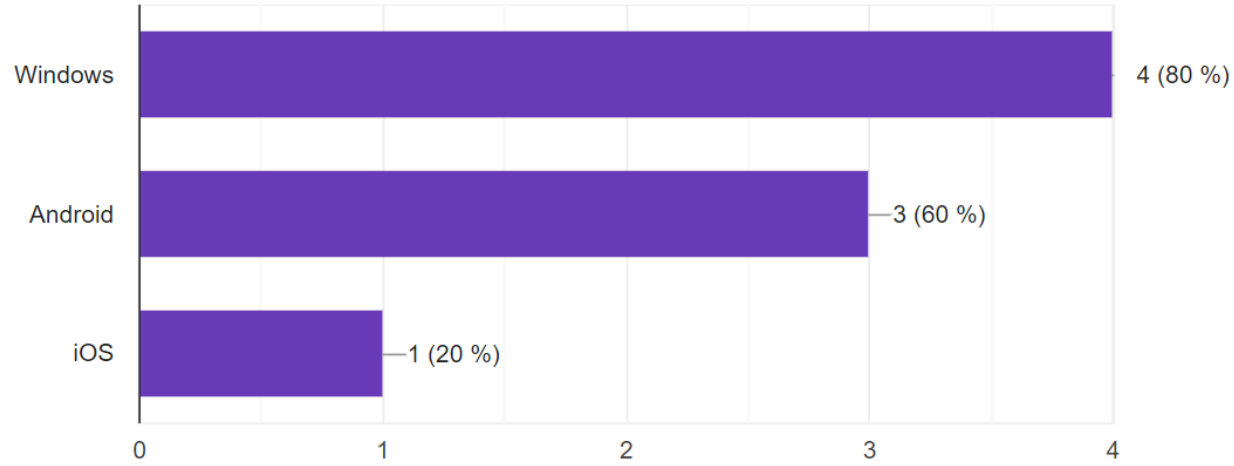
9/ Would you recommend the Dys2Go learning games to your colleagues to be used with young dyslexic adults? *(1 - not at all; 5 – definitely yes)*



10/ Which version did you use? (you may tick more than one box)

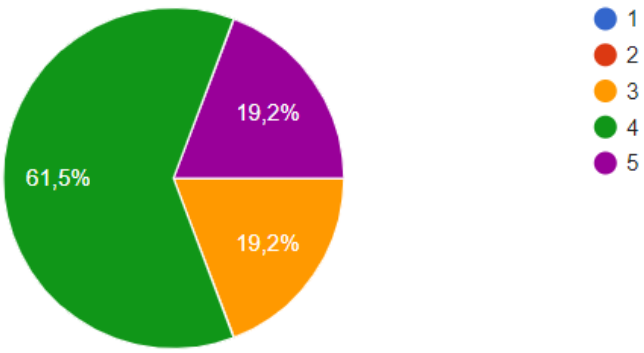


11/ Which version do you prefer?

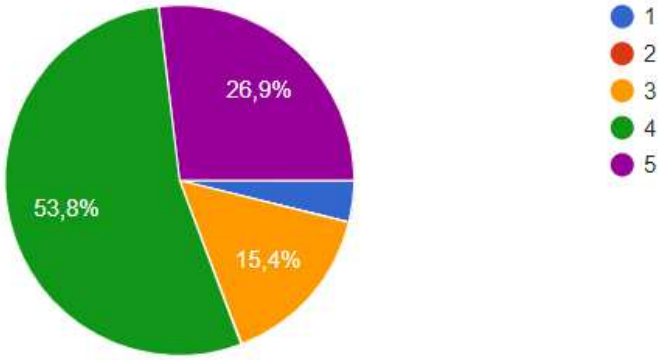


Questionnaire for students (26 responses)

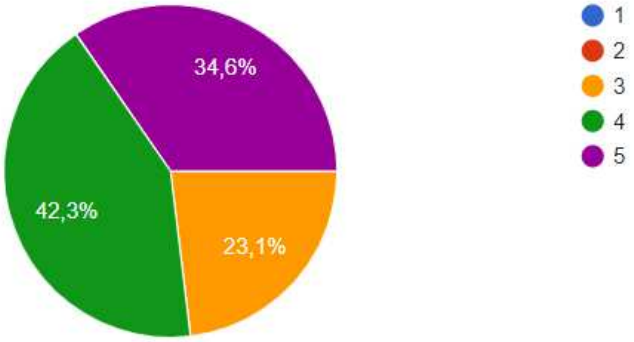
1/ What is your overall impression of the Dys2Go learning games? *(1 – very bad; 5 – excellent)*



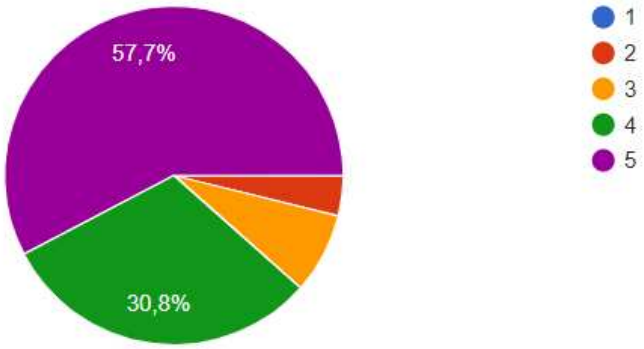
2/ How interesting do you find the topics of the Dys2Go learning games and storylines? *(1 – not at all; 5 – very interesting)*



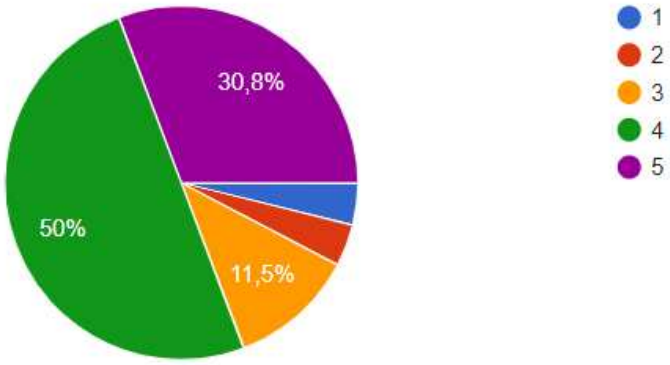
3/ Would you like the Dys2Go learning games to be included by your teachers/trainers as part of their teaching? *(1 – not at all; 5 – very interesting)*



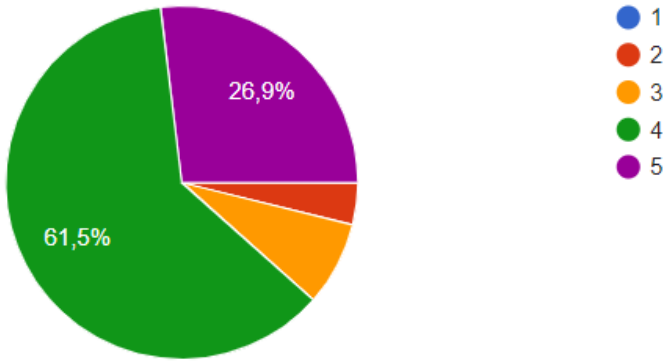
4/ Do you think that playing the Dys2Go learning games will help you to improve your skills? *(1 – not at all; 5 – very interesting)*



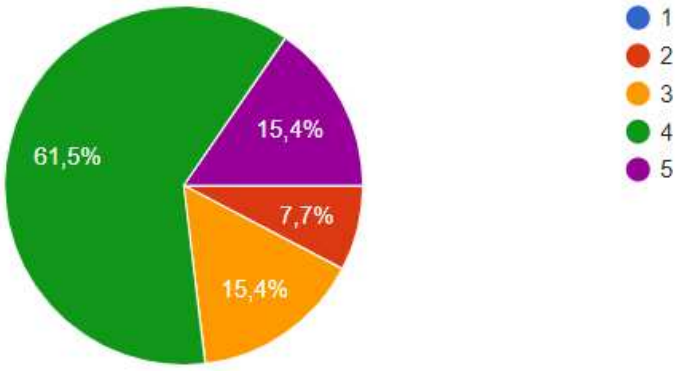
5/ Would you use the Dys2Go learning games at home for self-training? *(1 – not at all; 5 – very interesting)*



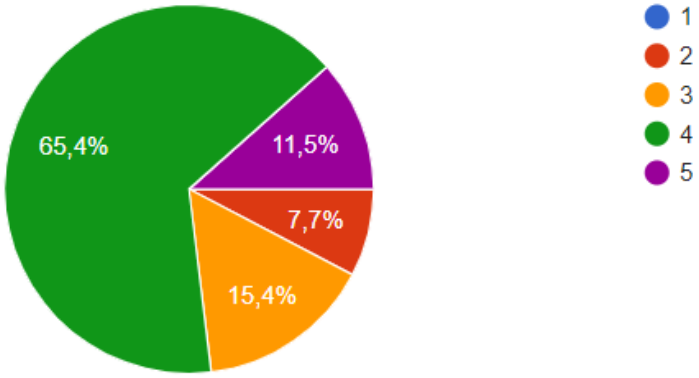
6/ Do you like the Dys2Go learning games design (images, layout, etc.)? *(1 – not at all; 5 – very interesting)*



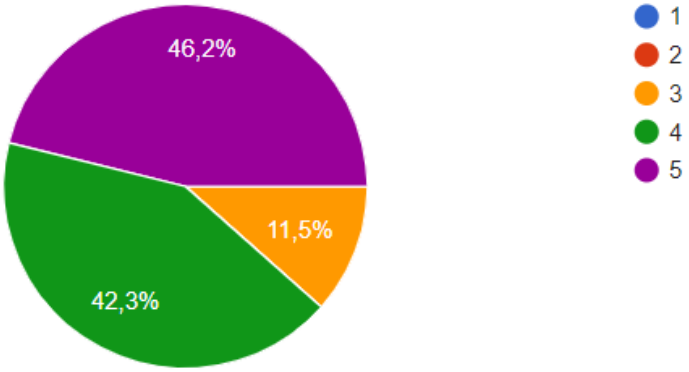
7/ Do you think the user interface of the Dys2Go learning games complies with your specific needs and preferences? *(1 – not at all; 5 – very interesting)*



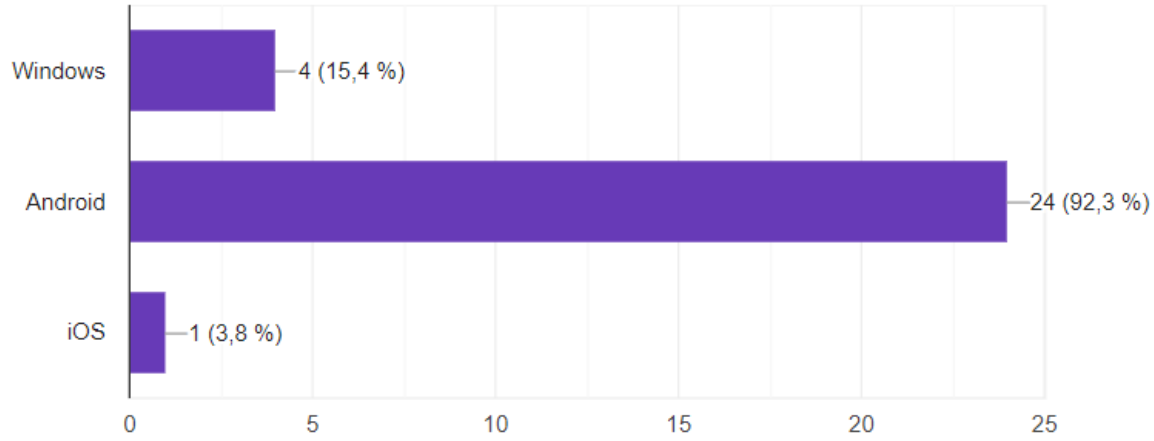
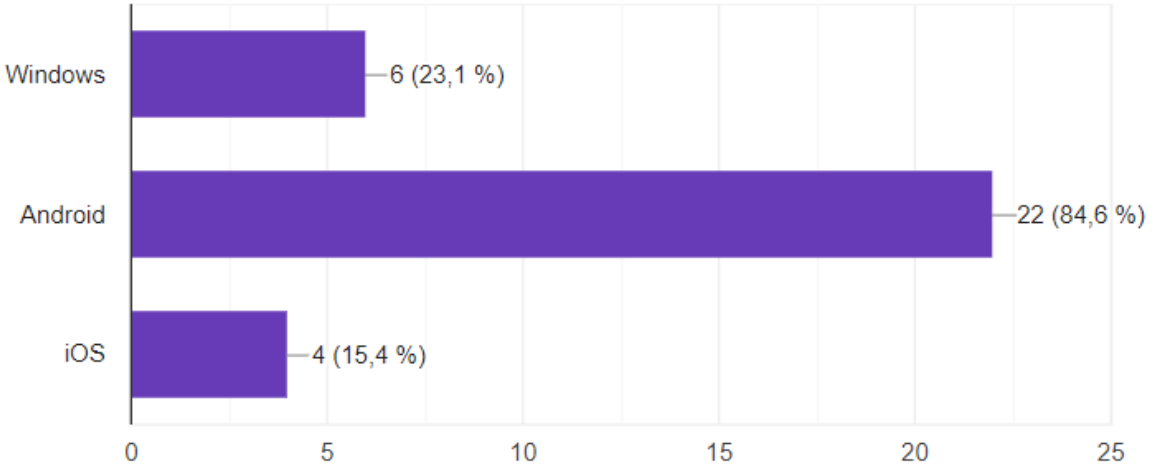
8/ Do you think the Dys2Go learning games are easy to be used (from technical point of view)? *(1 – not at all; 5 – very interesting)*



9/ Would you recommend the Dys2Go learning games to your friends and other young dyslexic adults? *(1 – not at all; 5 – very interesting*



10/ Which version did you use? (you may tick more than one box)



11/ Which version do you prefer?