



## GENEXIS EDUCATION

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#### Abstract.

The initial idea of GENEXIS was to resolve two great problems of teaching and learning process: inefficient consumption of teaching time on exercise creation and monitoring and lack of interest in study process among learners. It has been done by providing an attractive, engaging and simple learning and teaching environment that reflects the modern internet-saturated life.

GENEXIS is an online e-learning solution based on exercise generation. Special exercise generation engine was built to process exercise template and generate uniquely randomized variants of exercises. GENEXIS provides training, printing and testing services. GENEXIS makes teaching and learning more productive and less frustrating, benefiting everyone involved in the education and training process.

Keywords: e-learning, testing, distance learning.

### 1. INTRODUCTION

Hello, my name is Valerii Nikitin. I am here to present you GENEXIS project. Today I'm going to talk about traditional understanding of e-learning and how does GENEXIS correspond to it, main features and advantages of GENEXIS and our future plans.

First, let's talk about traditional understanding of e-learning. To begin with we should realize what is e-learning and what it is used for? In general there are 3 commonly used explanations for e-learning:

- Computer Based Training;
- Distance Learning;
- Web Based Training.

Anyhow e-learning is about delivering the object of studies „just-in-time” and „just-for-you” using networked information and communication technologies.

Among the benefits of e-learning I can mention following things:

- Option to study anywhere, anytime, anyhow;
- Self - paced learning pattern;
- Substantial cost savings due to elimination of travel expenses;
- Just-in-time access to timely information;
- Higher retention of content through personalized learning and others.

E-learning as a tool is used rarely on its own because of lack of motivation and permanence among students. But it can be used as a part of learning course or programme in more than one way. Traditionally e-learning is used:

- to achieve equal knowledge level of all students before lectures take place in auditorium (seminar);
- to allow students to prepare for next lesson in their own time and at their own pace;
- to revise after lectures;
- to combine theory and practice in appropriate way;
- to perfect ones knowledge in conformity with personal educational needs and demands.

**GENEXIS can and will provide all of the listed traditional features and benefits of e-learning as well as ensure additional benefit of exercise generation which is going to be discussed later.**

### 2. MAIN FEATURES AND ADVANTAGES OF GENEXIS

GENEXIS is an e-learning solution based on exercise generation engine that makes the learning process more efficient, attractive and engaging. It is based not only on „just-in-time” and „just-for-you” principles but also on „learning-by-doing” principle.

The initial idea of GENEXIS was to resolve two great problems of teaching and learning process:

- inefficient consumption of teaching time on exercise creation and monitoring;
- lack of interest in study process among learners.

It has been done by providing an attractive, engaging and simple learning and teaching environment that reflects the modern internet-saturated life.

What can GENEXIS offer right now? What are its advantages and benefits?

GENEXIS is an online service ready to be used by anyone irrespective of age, previous knowledge level, specialty and other factors. It is user-friendly and simple learning environment.

**GENEXIS makes the learning process more efficient.**

**GENEXIS is designed to help teachers engage students in learning process.**

Using GENEXIS, the teacher can produce core skills materials that can be delivered online or on paper.

**GENEXIS uses a methodology based on exercise generation that gives unlimited training opportunities.**

**The system has been created for teachers with the help of teachers to be easy to use and provide time economy.**

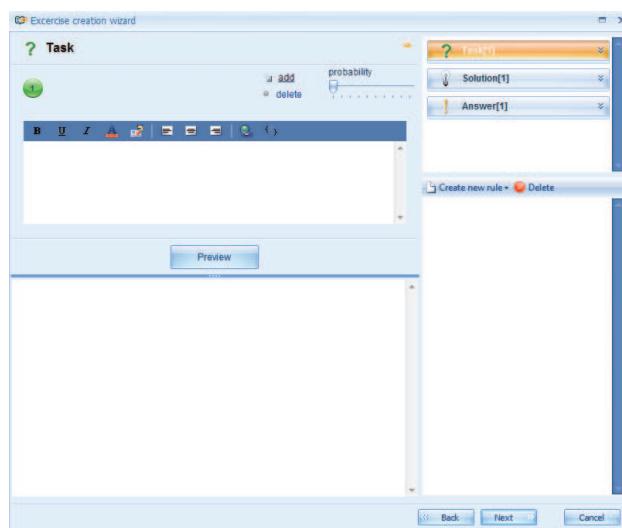


What are the main features of GENEXIS? What makes GENEXIS special?

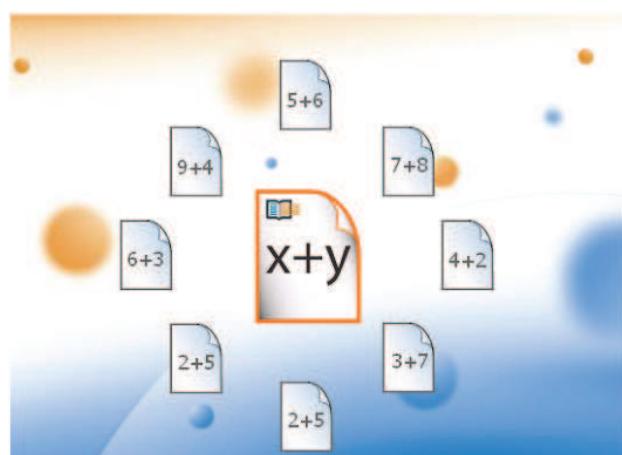
The core feature of GENEXIS is exercise generation. Typically, a student needs to practice repeating the same sort of problem solving activities to understand the logic of the solution. To facilitate this, education materials offer a few variations on each problem type.



GENEXIS is different: in the GENEXIS system any exercise can be replaced with an exercise template which describes a type of problem in general terms. An exercise template is easy to build using the exercise editor and can take as little as 10 minutes.



The specific content of the exercise template is generated anew every time it is used, providing an unlimited number of variations with no additional effort.



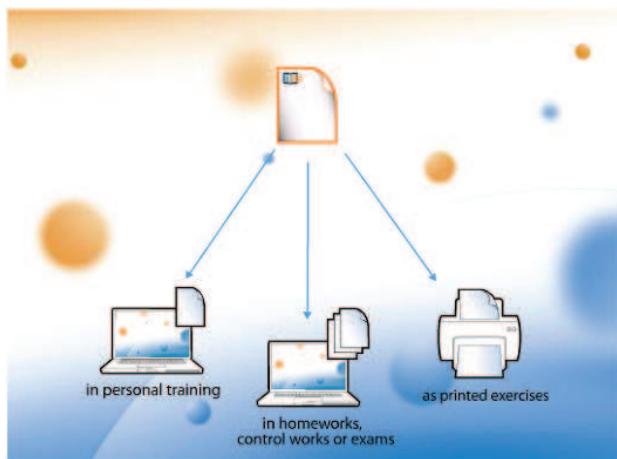
Exercise templates and other related materials can be biased to different vocational areas to make the learning more relevant and attractive to the student. GENEXIS also makes it easy for the teacher to differentiate ability levels within a group using the same exercises.

GENEXIS provides exercise answer evaluation (correct/incorrect) and step-by-step solution for all exercises. When student solves a problem (task/exercise) and submits the answer, GENEXIS automatically checks if the answer is correct. GENEXIS is able to verify different types of user answers. This could be text answer, number and multiple choice answers. Additionally GENEXIS is able to validate answer with mathematical or chemical formulas in it. When answer has been validated GENEXIS shows a step-by-step solution process for the task and provides correct answer.

These features reduce the routine grind of comparing student answers to the answer key as well as enable students to understand problems better and learn from their mistakes.

### 3. HOW CAN ANYONE USE GENEXIS EXERCISES?

GENEXIS exercises can be used in three different and flexible ways - a major advantage of GENEXIS over traditional textbooks.

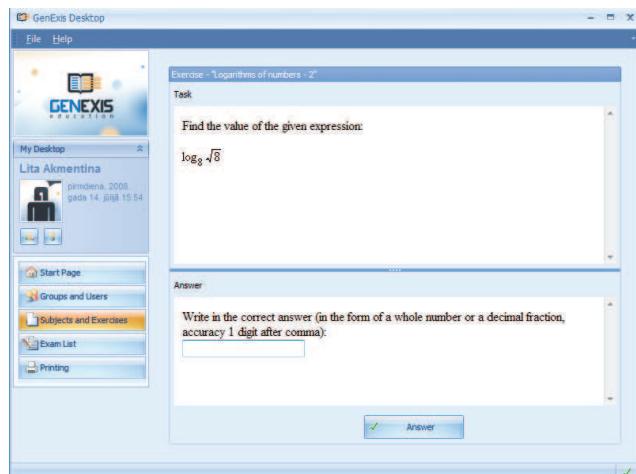


#### 1. Training.

GENEXIS provides individualized training and practice, enhanced with a powerful personal statistics tool. This engages students in the learning process, helping them manage their own studies and identify the areas where they need assistance. For now it is possible to undergo training by using GENEXIS exercise browser. Using exercise browser it is possible to look through available subjects and topics and find exercises user is interested in.

When user has found exercises he/she is interested in it is possible to run an exercise of his/her own choice or choose to run random exercise from the selected subject. When running a random exercise the system selects randomly an exercise from all available exercises in this folder or subfolders.

When first running an exercise user can see the task and the answer input form under it.

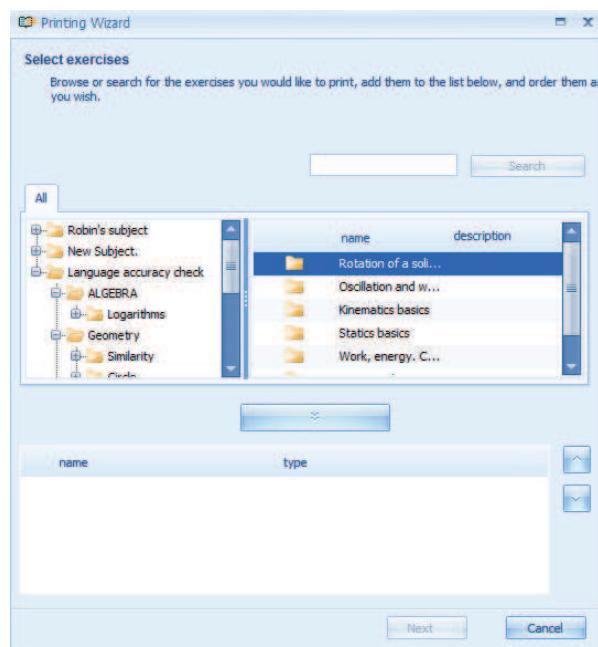


It is possible to define more than one type of answer (text, number, formula, multiple choice answers) and there can be more than one answer to the task. User should enter the values of answers or make selection of given answer choices and then click answer. System automatically checks the answers and shows the result as well as step-by-step solution for the task.

#### 2. Printing.

Traditional printed educational materials can be produced using GENEXIS exercises. A range of printing options support the creation of take-home tests with answers, handouts of solution examples and question sheets for written tests and exams.

To easily and quickly print an exercise special exercise printing wizard has been developed.



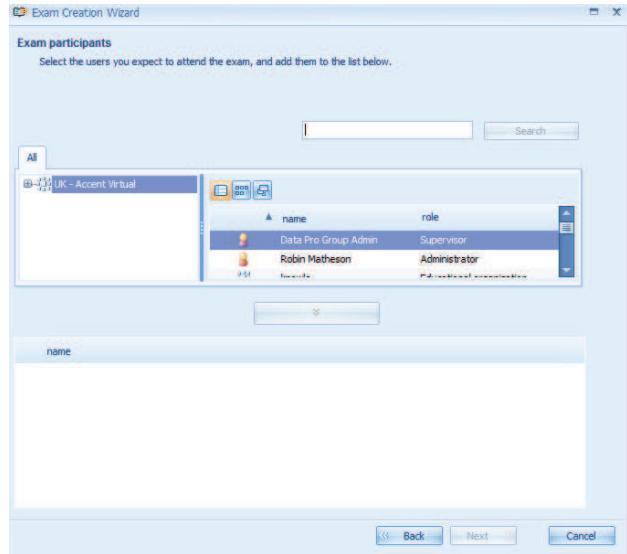
Using this wizard it is possible to select exercises and define number of question sets to be printed (each set of exercises will have its own variations of the same tasks). The print preview option allows changing the printing properties and seeing changes on fly. It is possible to choose whether to print one question per page or all on one page and set other options. Exercise printing wizard generates two printing sets - one for students and the second for teachers. The first contains only tasks, but the second has step-by-step solutions and answers as well. This will make it easy for teachers to check and explain home works as well as printed tests and exams. Also it is possible to save generated sets of exercises in the system and look through them using computer. Each question set has its name, date and question id, so it is easy to find saved project in system.

#### 3. Testing.

GENEXIS includes a system of online knowledge evaluation based on scheduled, timed tests.

Using exam creation wizard it is possible to create a test fast and easy. Wizard consists of three stages: setting up options, selecting users and selecting exercises for the test. First, user should set testing properties, such as start time, end time, date, and subject. It is possible to show or hide results, solution, and summary from students. It is possible to allow users to start and finish exam later.

When selecting users it is possible to select not only students, but teachers and administrators as well.



When selecting exercises it is possible to select exercise or subject. If subject is chosen then GENEXIS will randomly select exercise from this subject.

Tasks for the test are generated only at the moment when user chooses to run exam. It is not possible to somehow clarify the content of tasks in advance.

After the test has been completed it is possible to see user statistics which contain score and time spent on tasks. If student was not present on the exam then it will be shown. Teachers are able to see each task, step-by-step solution and result. If it is required teacher could change particular question result and must leave the comment. When teacher has finished checking exam scores, tests are set as checked and results are available to students. Student is able to see personal scores, score corrections done by teacher and comments.

Additionally a set of exercises created on the basis of traditional educational curriculum under the supervision of experienced teachers is available to GENEXIS users in five different languages.

#### 4. CLIENTS

GENEXIS is a good solution for courses or schools for student training and testing.

GENEXIS has no infrastructure costs; it is ready to be used by course companies or schools right after registration.

All the information on courses and schools available for the registered users is available on GENEXIS web site. Users can search for courses they are interested in by country, city, or subject and apply for them through GENEXIS. After registration it is possible for course companies or school to give user access to exercises for training purposes. This involves user into learning process and increases user interest in courses or studies.

By using GENEXIS it is possible to create home works for students. Teacher could review their results before the next lesson and prepare new study or revising materials more effectively.

GENEXIS exercise generation feature is very useful when it is needed to assess individual progress of students in the group. By using this feature it is impossible to prepare exercise/exam results before the exam or copy them from other students. Also this feature can secure the creation of unique home works for each student.

#### 5. FUTURE PLANS

Everyday project work continues on improving GENEXIS functionality and design to make it even better. I have to thank our clients and partners in different countries for their support and feedback. We try to take into account every opinion and it only helps us to make right decisions for GENEXIS future and to set forward new goals that need to be achieved.

In future plans for GENEXIS it is planned to provide several integration solutions for schools and universities. They are as follows:

- Export of testing results. This is important feature enabling GENEXIS to integrate with course or school learning management system.
- Support of SCORM model. This is a big step in the same direction of integration of GENEXIS with course or school learning management system.
- Import of users. This could help with user registration, especially when there are more than 100 users.
- Windows domain support is a nice feature for university domains. By enabling this it would be possible to login into GENEXIS automatically using windows user account credentials.
- Online system of courses. This is a huge and long term goal that will require a lot of work. But after implementing this functionality we will succeed in enabling online learning over internet with GENEXIS. If we combine online courses with virtual communication tools it will be possible to perform completely virtual study course through internet. This will make travelling for students an unnecessary thing. It will be possible for courses and schools to provide education through internet and attract students from

different countries which are more than any local market could provide on its own.

## 6. SUMMARY

So we talked about traditional understanding of e-learning and how does GENEXIS correspond to it, main features and advantages of GENEXIS and our future plans.

GENEXIS can and will provide all of the traditional features and benefits of e-learning as well as ensure additional benefit of exercise generation online system of courses.

GENEXIS helps make the learning process more efficient, by generating unlimited random variations of given exercises on any theme or subject.

Using GENEXIS, the teacher can produce core skills materials that can be delivered online or on paper.

GENEXIS is designed to help teachers engage students in the learning process so that they can achieve consistent and measurable improvements in their performance.

GENEXIS uses a methodology based on exercise generation which is stimulating, varied and relevant to the vocational interests of the learner.

The system has been created for teachers with the help of teachers to be easy to use whether the student is home-based, work-based or in the classroom.

It is designed for integration with existing administrative and education management systems and can be used to help learners build e-portfolios or personal learning plans.

GENEXIS helps make teaching and learning more productive and less frustrating, benefiting everyone involved in the education and training process.

For more information, please visit our website:  
<http://www.genexispro.com/>

## THE AUTOR



**Valerii Nikitin**

**Career:**

- 2.5 years OptumPlus as developer making enterprise resource planning system Binord.
- 2.5 years Accenture as senior developer making banking MERIDEA, SAMPO and telecommunication projects NOKIA, TeliaSonera.
- 1.5 years Global Consulting Partners as analytic in making credit issue web system for TRUST bank
- 1.5 year till now in Data Pro Group as manager in e-learning project GENEXIS.

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